

Report No. 20 of the
LAKE SIMCOE DISTRICT

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Forest Resources Inventory

— 1957 —

Division of Timber Management

Ontario Department of Lands and Forests

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PREFACE

- In little more than a century, Southern Ontario has been transformed from an area of virgin forest into an agricultural and industrial region. The early settlers regarded the forest as an enemy that encroached upon the lands they required for farms and communities and formed a physical barrier between the isolated settlements. The abundance of wood and the scarcity of markets led to the belief that the supply of wood was inexhaustible. These attitudes, so inimical to forestry, persisted until recent times and, even now, have not completely disappeared.

Forests, mainly farm woodlots, now cover only a small portion of Southern Ontario and, in many places, are so reduced in size that they no longer fulfil many of their normal attributes. Historical evidence to prove the deterioration of soil and physical condition which follow on the destruction of forests is overwhelmingly conclusive. The process of deterioration is usually very similar. Forests are cleared for the expansion of agriculture or the exploitation of other resources, and the remaining forests are progressively degraded through unwise cutting, excessive grazing, and fires. On vulnerable soils and sites these practices lead to: cumulative erosion by wind and water; loss of the surface soil; deposition of erosion debris on fertile agricultural lands; reduction in water storage capacity; silting of irrigation works and the spread of aridity. The ultimate result of such a process is the destruction of the physical bases of life, the formation of deserts, and consequent social deterioration.

It is, therefore, no exaggeration to say that the reclamation of the unproductive and sub-marginal areas, and the preservation and improvement of existing woodlands, are matters of great importance to Ontario. The extension of the province-wide survey of the forest resources of Ontario to include these southern agricultural areas may be regarded as the first step in a programme of forest management and development.

The survey was authorized in 1952, and work was started by the Division of Timber Management early in 1953. Since April 1, 1951, the Federal Department of Northern Affairs and National Resources has reimbursed to the Province one-half of the expenditures incurred in forest resources inventory, under the terms of an agreement with the Province pursuant to the provisions of the Canada Forestry Act.

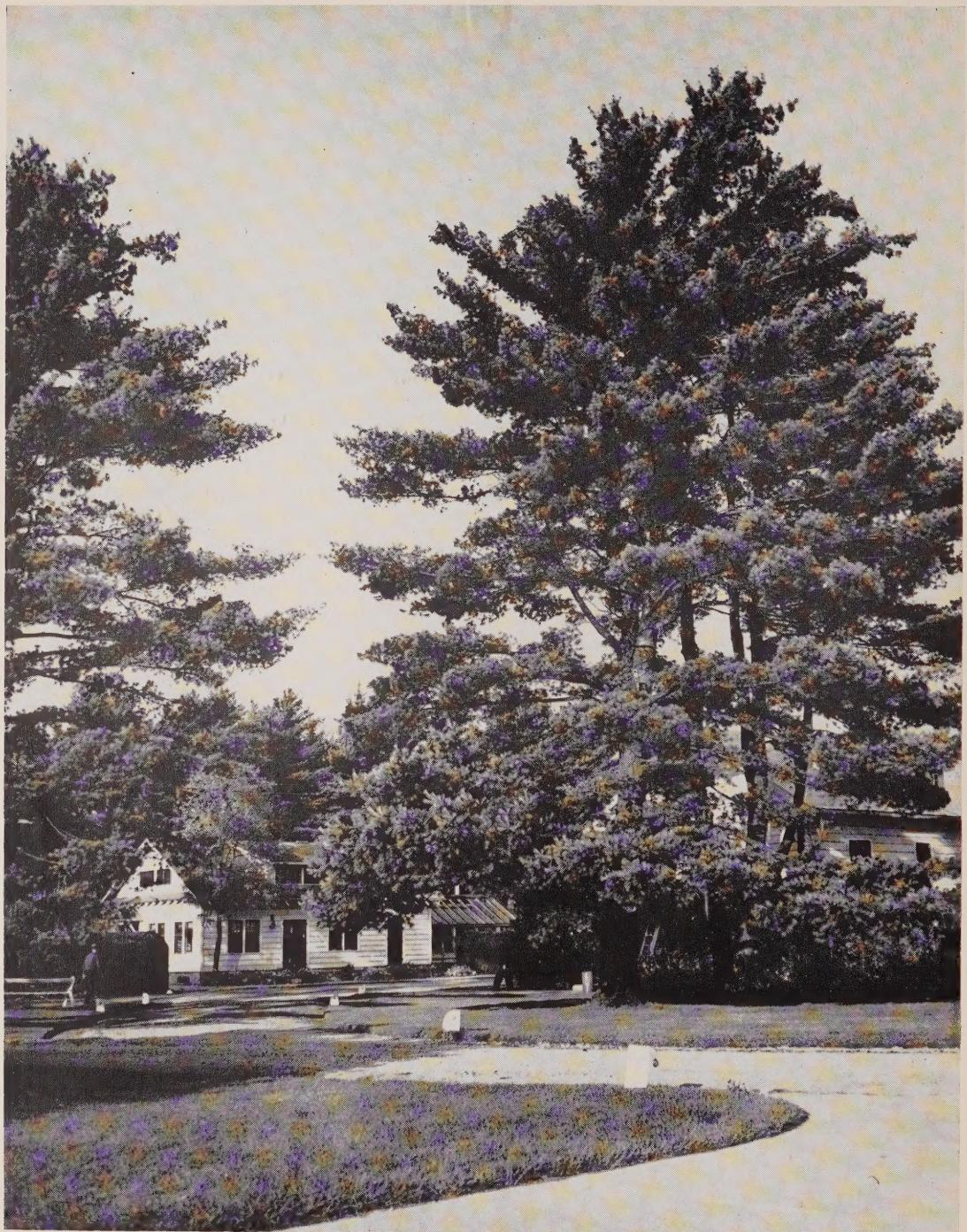
For purposes of administration of the renewable natural resources, the Department of Lands and Forests has set up twenty-two districts, each administered by a District Forester and staff, from an office located centrally in the district. The forest resources inventory covers these twenty-two districts, totalling 199,000 square miles, and comprising the accessible forest area of Ontario. This report, the twentieth in the series, deals with the results of the inventory in the Lake Simcoe district.

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SURVEY HIGHLIGHTS

1. The total area of the Lake Simcoe district, excluding 27,980 acres administered by the Federal Government, is 3,081,312 acres, or 4,815 square miles.

2. Inland waters, excluding the "Great Lakes," cover 243,892 acres, or 8 per cent of the total area. Lake Simcoe, the fourth largest inland lake in Ontario, covers 177,236 acres, or 73 per cent of the water area of the district.

3. The total land area of the district, including Federal lands, is 2,865,400 acres. Forested areas cover 21.1 per cent of the land area, and 69.3 per cent is devoted to agriculture. Other areas, which include Federal lands, towns, cities, roads, power lines, gravel-pits and railroads, account for the remaining 9.6 per cent.

4. The forested area has been classified as 80 per cent productive and 20 per cent non-productive. Agricultural areas are classed as 75 per cent developed agricultural land, 17 per cent grass and meadow land, and 8 per cent wooded pasture.

5. Patented land forms 88 per cent of the productive forest area within the district, while Crown lands account for 12 per cent. For the purposes of

this report, forested areas administered under an agreement with the Minister of Lands and Forests, are classed as Crown lands.

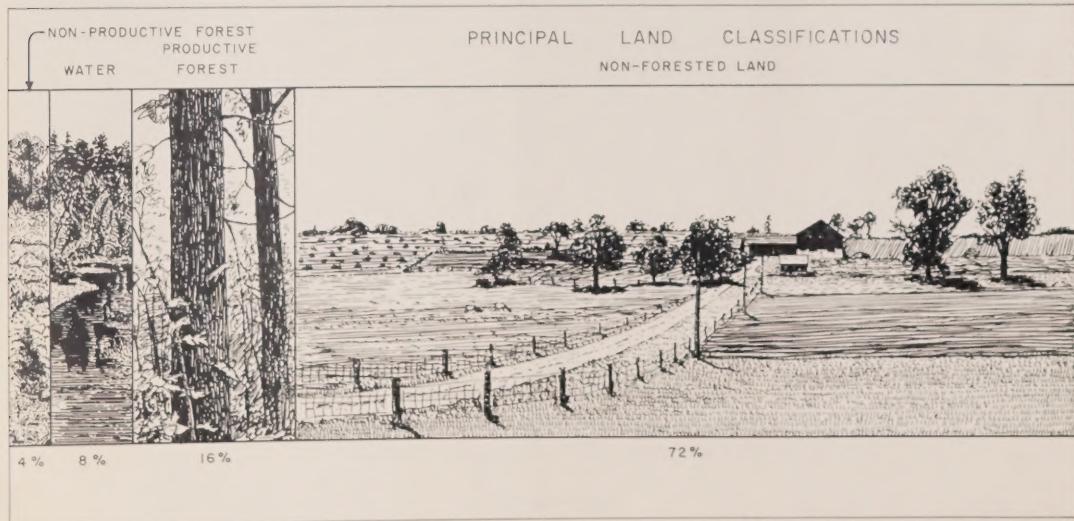
6. The age class distribution on productive forest lands shows: 9 per cent mature, 54 per cent immature, 11 per cent all-aged, 21 per cent young growth, and 5 per cent reproducing forest.

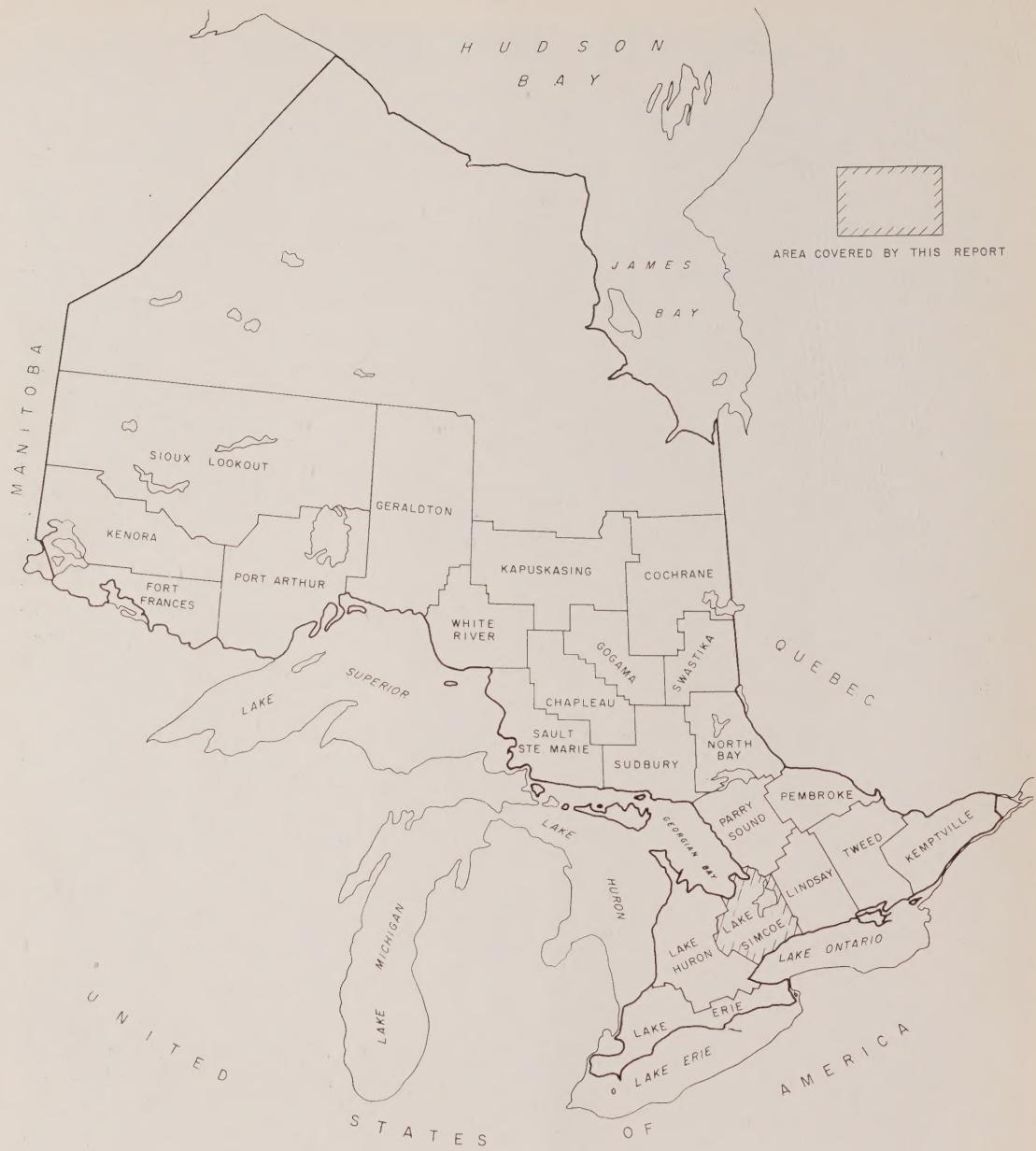
7. The hardwood cover type occupies 57 per cent of the productive forest land; the mixedwoods type occupies 32 per cent, and the coniferous type only 11 per cent.

8. The primary growing stock in the Lake Simcoe district is just over 506 million cubic feet and averages 1,047 cubic feet per acre. Hardwoods form 79 per cent and conifers 21 per cent of the total volume.

9. Sugar maple is the principal species in the Lake Simcoe district, comprising 22 per cent of the total growing stock. The next most prevalent species, by volume, are elm, poplar, white cedar and soft maple.

10. Forested areas within the district can support an annual cut of 12.8 million cubic feet. Hardwood species make up 85 per cent of the allowable cut.





AREA COVERED BY THIS REPORT



Forest resources inventory photograph of the Village of Maple, taken with a six-inch focal length aerial camera from an altitude of 7,920 feet. Scale of photograph: 4 inches to the mile.



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FOREST INVENTORY

Historical Background

- Because of raiding by the Iroquois, the native Indian tribes withdrew from the area between Lake Ontario and Lake Simcoe prior to the arrival of the earliest settlers. During the French Regime, little settlement occurred in this region, although trading posts were periodically established on the Humber River, which formed part of the overland route between Lake Ontario and Lake Huron.

York, later to be called Toronto, was founded by the British in 1793. By the middle of the nineteenth century, the southern watersheds were well populated. Numerous sawmills and gristmills were in operation on all the streams, the Humber alone supporting over 90 mills by 1860. As early as 1796 there was a road north to Holland Landing. Settlement crept slowly northward and thinly encircled Lake Simcoe, and by 1850 settlers were established between Lake Simcoe and Georgian Bay.

The Northern Railway was built from Toronto to Holland Landing and Allendale in 1853, and extended to Collingwood in 1855. The Midland Railway was built to Midland in 1875, connecting it with Port Hope. As a result of this construction, mills were built in the southern part of Simcoe County and on Lake Simcoe. The supply area being small, these mills remained in operation only a short time, reaching their peak about 1870, and then declining rapidly. In contrast, the northern part of the county remained an important lumber producer for many years.

Midland stood in a virgin forest in 1870, and the first mill was built there in 1872. In 1900 it was, next to Ottawa, the leading sawmilling centre in Canada. Collingwood, Penetanguishene, Victoria Harbour and Waubaushene also were important lumbering centres. When the excellent pine stands along the south shore of Georgian Bay were cut, these mills were able to draw on vast areas to the north. This normally transient industry was sustained for a long time by logs driven to the bay down the numerous streams flowing from the Muskoka and Parry Sound regions and by others rafted across Georgian Bay from Manitoulin Island and the north shore of Lake Huron.

New York and Chicago competed for the white

pine from this region; and although Chicago was better situated in relation to the mills, the New York demand was so great that the pine continued to be shared between the two markets. Toronto and Port Hope were concentration points from which the lumber was trans-shipped to Oswego for Albany and New York. When the Erie Canal was freed of tolls in 1883, Georgian Bay lumber was shipped to Tonawanda and Buffalo by schooner, or by rail across Ontario, and Toronto ceased to be a lumber city of any importance.

The Lake Simcoe district now contains approximately one-third of Ontario's population, largely concentrated in the great industrial complex which extends along Lake Ontario westward from Oshawa. This development occurred originally because of the excellent transportation facilities and the cheap and plentiful supply of power, water, and suitable industrial land. It was further favoured by the presence of fine agricultural soils and a climate which permitted the development of the mixed farming and specialized agriculture required to maintain a modern urban society.

Within this district, the forested area is now restricted to the poorest sites. Hardwoods occur mainly in farm woodlots, while conifers appear mainly in plantations or on the rock outcrops in the northern part of the district. Although there is a ready market for forest products, including such specialized crops as Christmas trees, there is little possibility of the present forested areas being greatly increased in extent. In this district the production of wood fibre may be of secondary importance, and the chief value of forests may be in the provision of recreational areas, the prevention of erosion, the control of floods, and the maintenance of water levels.



White pine cones drying in trays.

Areas

The total area of the Lake Simcoe district, excluding Indian Reserve lands and other areas under the administration of the Federal Government, is 3,081,312 acres (table 1), 4,815 square miles. This area is made up of 5 counties containing 45 townships, part of the District of Muskoka, and Metropolitan Toronto, which includes : the City of Toronto ; the Towns of Leaside, Mimico, New Toronto and Weston ; the Villages of Forest Hill, Long Branch and Swansea ; and the Townships of Etobicoke, Scarborough, York, East York and North York.

TABLE 1.—*Total area classification into broad land and ownership groups.*

Land classification	Crown land acres	Patented land acres	Total acres
Productive forest land ¹	58,470	425,184	483,654
Non-forested land ²			
Developed agricultural land.....	2,555	1,491,697	1,494,252
Grass and meadow land.....	3,026	332,996	336,022
Non-reproducing burn.....	.....	94	94
Wooded pasture.....	936	155,596	156,532
Unclassified land ³	688	245,476	246,164
TOTAL.....	7,205	2,225,859	2,233,064
Non-productive forest ⁴			
Open muskeg.....	2,634	13,576	16,210
Treed muskeg (scrub).....	332	100	432
Brush, alder and flooded land.....	7,564	76,120	83,684
Rock outcrop.....	12,386	7,990	20,376
TOTAL.....	22,916	97,786	120,702
Water.....	243,892	.....	243,892
TOTAL AREA.....	332,483	2,748,829	3,081,312

¹ Land bearing or capable of bearing timber of a commercial character and not withdrawn from such use.

² Productive forest lands permanently withdrawn from timber production use.

³ Lands occupied by roads, railroads, towns, etc.

⁴ Lands which appear to be permanently out of commercial timber-producing class, owing to very low productivity.

Within the district, inland waters, excluding the "Great Lakes," cover 243,892 acres, or 8 per cent of the total area. Lake Simcoe, the fourth largest of the inland lakes of Ontario, accounts for 73 per cent of the water area within the district. Productive forest lands occupy 483,654 acres, or 16 per cent of the total area (fig. 1). Non-productive forest lands, which appear to be permanently unfit for commercial timber production, owing to very low



Cone-drying shed.

productivity, comprise 120,702 acres, or 4 per cent of the total area. Non-forested lands, which include areas permanently withdrawn from timber production, total 2,233,064 acres, or 72 per cent of the total area. Developed agricultural land, totalling 1,494,252 acres, comprises 67 per cent of the area within this classification (fig. 2). Grass and meadow land occupy 336,022 acres and 156,532 acres are classed as wooded pasture. These are low-density stands composed of a few large open-grown trees with wide-spreading crowns. In addition, there are 94 acres of non-reproducing burn and 246,164 acres of unclassified land occupied by cities, towns, villages, roads, railways, power lines, gravel-pits or otherwise withdrawn from forest production.

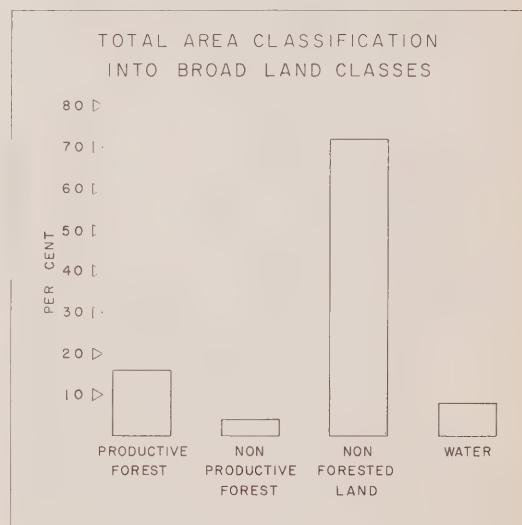


FIGURE 1

CLASSIFICATION OF NON-FORESTED LAND



FIGURE 2

An analysis of the principal land classifications by counties (table 2) indicates that 76 per cent within the District of Muskoka contains productive forest land, amounting to 40,902 acres. The greatest

area of productive forest land occurs in Simcoe County, where it totals 244,016 acres. This represents 23 per cent of the land area within Simcoe County, and accounts for 50 per cent of the productive forest land in the district. Peel County contains the smallest area of productive forest land within the district. The 25,372 acres in this classification represent nearly 9 per cent of the total land area in the county, and 5 per cent of the productive forest land in the Lake Simcoe district.

When the distribution of productive forest land is considered on a township basis (fig. 3), it is evident that the northern townships contain the greatest percentage within this classification. Productive forest land varies from a high of almost 82 per cent in Wood Township to less than one per cent in Toronto Gore Township.

Non-productive forest land, which occupies a relatively small area within the district, forms 30 per cent of Matchedash, 20 per cent of Baxter, and 17 per cent of Wood Township.

Agricultural land comprises 81 per cent of Peel County, 79 per cent of Dufferin County, 78 per cent of York County, 74 per cent of Ontario County and 66 per cent of Simcoe County. Metropolitan Toronto still has 28 per cent of its area classified as agricultural land, while the District of Muskoka contains only 3 per cent within this category.

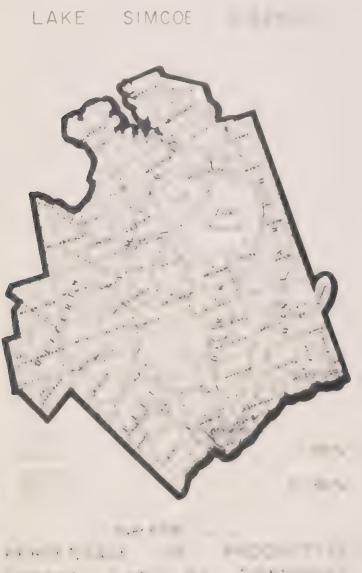


FIGURE 3

TABLE 2.—Principal land classifications by townships and counties—Lake Simcoe district.

Township and county ¹	Total area	Total land area	Forested land				Agricultural land						Other areas ²	
			Productive		Non-productive		Developed agricultural land		Grass and meadow		Wooded pasture			
			acres	acres	acres	per cent	acres	per cent	acres	per cent	acres	per cent	acres	per cent
			acres	acres	acres	per cent	acres	per cent	acres	per cent	acres	per cent	acres	per cent
Amaranth.....	65,574	64,954	4,222	6.5	6,650	10.2	49,984	77.0	2,150	3.3	596	0.9	1,352	2.1
East Garafraxa.....	42,632	42,438	4,776	11.2	1,560	3.7	27,954	65.9	5,916	13.9	1,314	3.1	918	2.2
East Luther.....	40,000	39,324	1,874	4.8	4,538	11.5	29,962	76.2	1,170	3.0	954	2.4	826	2.1
Melancthon.....	77,016	76,282	8,244	10.8	7,718	10.1	55,326	72.5	2,356	3.1	1,218	1.6	1,420	1.9
Mono.....	70,030	69,392	10,918	15.7	2,078	3.0	36,998	53.3	13,958	20.1	3,886	5.6	1,554	2.3
Mulmur.....	70,160	69,306	14,174	20.4	714	1.0	37,336	53.9	11,602	16.8	4,222	6.1	1,258	1.8
DUFFERIN COUNTY.....	365,412	361,696	44,208	12.2	23,258	6.4	237,560	65.7	37,152	10.3	12,190	3.4	7,328	2.0
Baxter.....	40,432	33,052	23,934	72.4	6,574	19.9	378	1.1	1,188	3.6	102	0.3	876	2.7
Wood.....	23,330	20,818	16,968	81.5	3,526	16.9	.....	.....	220	1.1	.....	.....	104	0.5
MUSKOKA DISTRICT ³	63,762	53,870	40,902	75.9	10,100	18.8	378	0.7	1,408	2.6	102	0.2	980	1.8
Brock.....	69,192	68,570	9,338	13.6	5,238	7.7	41,320	60.3	7,160	10.4	3,364	4.9	2,150	3.1
East Whitby.....	35,876	35,362	1,360	3.8	438	1.3	15,058	42.6	9,240	26.1	2,090	5.9	7,176	20.3
Mara.....	63,718	61,882	15,316	24.8	2,258	3.7	30,592	49.4	8,686	14.0	3,366	5.4	1,664	2.7
Pickering.....	74,306	73,012	4,730	6.5	580	0.8	40,140	55.0	14,146	19.4	4,844	6.6	8,572	11.7
Rama.....	39,838	32,424	12,968	40.0	4,544	14.0	3,978	12.3	3,104	9.6	4,478	13.8	3,352	10.3
Reach.....	67,448	65,358	7,034	10.8	5,636	8.6	35,348	54.1	12,044	18.4	3,430	5.2	1,866	2.9
Scott.....	49,878	49,304	9,202	18.7	2,302	4.7	28,714	58.2	4,644	9.4	3,638	7.4	804	1.6
Scugog.....	16,518	11,234	1,468	13.1	1,204	10.7	4,636	41.3	2,306	20.5	510	4.5	1,110	9.9
Thorah.....	35,010	34,634	4,432	12.8	640	1.8	18,726	54.1	6,446	18.6	2,972	8.6	1,418	4.1
Uxbridge.....	52,364	52,028	8,824	17.0	476	0.9	26,790	51.5	13,150	25.3	1,428	2.7	1,360	2.6
West Whitby.....	36,202	35,542	2,030	5.7	470	1.3	20,246	57.0	7,374	20.7	2,022	5.7	3,400	9.6
ONTARIO COUNTY.....	540,350	519,350	76,702	14.8	23,786	4.6	265,548	51.1	88,300	17.0	32,142	6.2	32,872	6.3
Albion.....	58,062	57,488	5,948	10.4	716	1.2	33,356	58.0	12,488	21.7	3,092	5.4	1,888	3.3
Caledon.....	70,072	69,478	11,766	16.9	2,486	3.6	34,940	50.3	14,170	20.4	4,250	6.1	1,866	2.7
Chinguacousy.....	83,630	83,064	4,942	6.0	524	0.6	61,742	74.3	8,784	10.6	3,252	3.9	3,820	4.6
Toronto.....	67,686	67,104	2,538	3.8	140	0.2	36,274	54.1	6,738	10.0	1,648	2.4	19,766	29.5
Toronto Gore.....	19,428	19,020	178	0.9	.....	.....	14,888	78.3	2,294	12.1	690	3.6	970	5.1
PEEL COUNTY.....	298,878	296,154	25,372	8.6	3,866	1.3	181,200	61.2	44,474	15.0	12,932	4.4	28,310	9.5
Adjala.....	45,696	45,340	5,612	12.4	630	1.4	24,550	54.2	10,306	22.7	3,180	7.0	1,062	2.3
Essa.....	69,110	68,812	9,356	13.6	1,130	1.6	40,726	59.2	5,460	7.9	3,832	5.6	8,308	12.1
Flos.....	69,330	68,296	13,606	19.9	2,790	4.1	40,766	59.7	5,820	8.5	3,388	5.0	1,926	2.8
Innisfil.....	70,752	70,422	10,266	14.6	1,878	2.7	43,888	62.3	5,904	8.4	2,984	4.2	5,502	7.8
Matchedash.....	52,126	47,736	27,292	57.2	14,356	30.1	3,290	6.9	1,042	2.2	1,202	2.5	554	1.1
Medonte.....	70,538	70,006	19,226	27.4	1,912	2.7	31,624	45.1	9,082	13.0	6,150	8.9	2,012	2.9
Nottawasaga.....	99,250	98,168	12,174	12.4	1,938	2.0	63,864	65.1	8,082	8.2	7,692	7.8	4,418	4.5
Orillia.....	87,118	79,406	28,220	35.5	6,616	8.3	23,856	30.0	8,378	10.6	7,198	9.1	5,138	6.5
Oro.....	78,458	77,138	19,216	24.9	1,416	1.9	40,066	51.9	10,544	13.7	3,180	4.1	2,716	3.5
Sunnidale.....	57,382	56,386	11,802	20.9	1,168	2.1	33,998	60.3	3,612	6.4	3,288	5.8	2,518	4.5
Tay.....	56,650	54,474	15,624	28.7	4,366	8.0	17,972	33.0	6,152	11.3	4,708	8.6	5,652	10.4
Tecumseth.....	70,296	69,704	4,664	6.7	642	0.9	50,840	72.9	7,424	10.6	3,950	5.7	2,184	3.2
Tiny.....	85,754	85,062	36,264	42.6	2,488	2.9	35,036	41.2	4,756	5.6	2,838	3.4	3,680	4.3
Totoronto	45,430	45,282	6,546	14.4	442	1.0	19,158	42.3	3,296	7.3	1,816	4.0	14,024	31.0
Vespra.....	70,470	69,262	19,446	28.1	5,850	8.4	29,746	43.0	7,482	10.8	2,758	4.0	3,980	5.7
West Gwillimbury.....	52,856	52,170	4,702	9.0	2,654	5.1	34,356	65.8	6,394	12.3	2,190	4.2	1,874	3.6
SIMCOE COUNTY.....	1,081,216	1,057,664	244,016	23.1	50,276	4.7	533,736	50.5	103,734	9.8	60,354	5.7	65,548	6.2

TABLE 2.—(Cont'd)

Township and county ¹	Total area	Total land area	Forested land						Agricultural land						Other areas ²	
			Productive		Non-productive		Developed agricultural land		Grass and meadow		Wooded pasture					
			acres	acres	acres	per cent	acres	per cent	acres	per cent	acres	per cent	acres	per cent	acres	per cent
East Gwillimbury	63,258	62,578	9,206	14.7	3,562	5.7	31,706	50.7	10,286	16.4	8,908	9.4	1,940	3.1		
Georgina	40,246	39,836	9,396	23.6	2,182	5.5	14,256	35.8	5,792	14.5	3,274	8.2	4,936	12.4		
King	91,422	90,672	8,986	9.9	2,434	2.7	55,066	60.7	14,398	15.9	6,476	7.1	3,312	3.7		
Markham	69,272	68,384	2,642	3.9	32	.....	49,706	72.7	3,990	5.8	3,624	5.3	8,390	12.3		
North Gwillimbury	33,418	33,094	4,672	14.1	940	2.8	18,862	57.0	3,930	11.9	1,344	4.1	3,346	10.1		
Vaughan	70,478	69,758	4,688	6.7	42	0.1	46,014	66.0	6,828	9.8	3,722	5.3	8,464	12.1		
Whitechurch	64,132	63,242	10,226	16.2	94	0.1	33,562	53.1	11,806	18.7	3,696	5.8	3,858	6.1		
YORK COUNTY	432,226	427,564	49,816	11.6	9,286	2.2	249,172	58.3	57,000	13.3	28,044	6.6	34,246	8.0		
METROPOLITAN TORONTO	150,212	149,102	2,638	1.8	130	0.1	26,658	17.9	3,954	2.7	10,768	7.2	104,860	70.3		
LAKE SIMCOE	177,236															
TOTAL — LAKE SIMCOE DISTRICT	1,109,292³	2,865,400⁴	483,654	16.9	120,702	4.2	1,494,252	52.1	336,022	11.7	156,532	5.5	274,144⁴	9.6		

¹ Included under this heading are the District of Muskoka, Metropolitan Toronto, and Lake Simcoe.

² Other areas include all land administered by the Federal Government, as well as roads, railroads, cities, towns, villages, gravel-pits, etc.

³ Muskoka District includes only those townships, or parts of townships, within the Lake Simcoe District.

⁴ These totals include land areas administered by the Federal Government.

Forest Land Ownership

Settlement within this district was well-advanced by 1850, and the first settlers, who were primarily interested in agriculture, often burned the timber to clear the land. The Act of 1868 reserved pine trees on land located as free grants, but passed the pine trees to the grantee with the land when patent was issued. After 1880, however, it was the usual practice in Ontario to reserve pine timber to the Crown at the time patent was issued.

This reservation of pine trees continued through to 1937, except that in 1913 there was an amendment to The Public Lands Act which provided that where land was not in timber licence and the locatee was in residence with improvements he could request that pine trees be included in the patent, or in the event that patent had previously been issued, he could request a pine patent. The Public Lands Amendment Act, 1946, granted to the patentee all species of timber on land disposed of for agricultural purposes and patented prior to May 1, 1880. Subsequently, all pine reservations were removed

from lands patented for agricultural purposes, regardless of the date of patent (Stat. 1951, chap. 71).

The Lake Simcoe district is essentially an area devoted to agriculture and urban development, and it is hardly surprising that only 3 per cent of the land area within this district is classified as Crown land. Of the total area of the Lake Simcoe district, 2,748,829 acres, or 89 per cent, is patented land and 88,591 acres, or 3 per cent, is Crown land; the balance of 243,892 acres, or 8 per cent, is water area. Considering the 483,654 acres of productive forest land, 425,184 acres, or 88 per cent, is patented land, and 58,470 acres, or 12 per cent, is Crown land.

For the purpose of this report, Crown lands include 20,913 acres of county forests and 2,089 acres of authority forests administered under the terms of legislation of the Forestry Act (Stat. 1952, chap. 32). This Act permits the Minister of Lands and Forests to enter into an agreement with the owners of lands that are suitable for forestry purposes for the reforestation and management of such lands for a stated period of years, which must not be less than twenty years.

Municipalities may, under the terms of The Trees Act (R.S.O. 1950, chap. 399), purchase land and either place the responsibility of reforestation and management in the hands of the Province through co-operative agreements, or carry out the planting and management of the forests without an agreement. The agreement provides that the Province will assume the responsibility for re-establishment and care of the forest for a stated period of years, usually fifty in recent agreements. At the end of the agreed period, the municipality may exercise one of three options: first, to renew the agreement; second, to take over the project by paying to the Crown the cost of the development without interest, while revenue received by the Province during the period of the agreement is credited to the project; third, to relinquish title to the land and receive its original purchase price. Within the Lake Simcoe district, four counties — Simcoe, Dufferin, York and Ontario — have forests under agreement with the Crown.

Simcoe County established the first county forest in Ontario in 1922. At the present time there are five county forests — Angus, Drury, Hendrie, Orr Lake, and Wildman — totalling 13,846 acres, within Simcoe County. This district also contains the Dufferin County Forest of 2,042 acres, the Vivian Forest in York County which contains 3,472 acres, and the Uxbridge Forest of 1,553 acres in Ontario County.

The Conservation Authorities Act (R.S.O. 1950, chap. 62) permits the authority to enter into an agreement with the Minister of Lands and Forests for the administration of Authority Forests. These agreements are similar, although not identical, to those entered into by the municipalities and the Crown. The Grand Conservation Authority was established in 1948 and the Grand Authority Forest, which includes 1,073 acres within the Lake Simcoe district, is administered under an agreement. The Humber Valley Conservation Authority was incorporated in 1948 and the Humber Forest, which at present has an area of 1,016 acres, was started in 1951. This Authority, along with the Etobicoke-Mimico, Don, and R.D.H.P. Conservation Authorities, was incorporated into the Metropolitan Toronto and Region Conservation Authority on February 1, 1957, under an amendment to the Conservation Authorities Act.

The relatively small area of Crown land within this district includes a provincial forest tree nursery, established at Midhurst in 1922; a seed extraction plant, established at Angus in 1923; and the Southern Research Station located 18 miles north of Toronto, near Maple. This 100-acre property contains the Lake Simcoe district office, the central radio station of the Department, storage sheds, a storage vault for records, a limnology laboratory for fisheries research, a biological research building, and a greenhouse for tree breeding and silvicultural research.

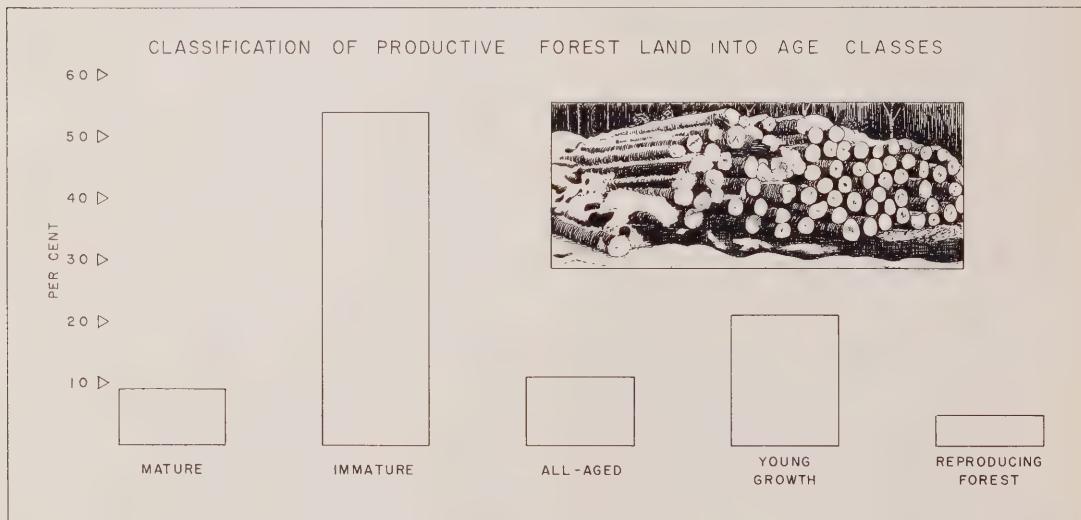


FIGURE 4

A modern forest pathology laboratory was completed at Maple in 1953. This building is provided and maintained by the Department of Lands and Forests as its part in a co-operative scheme directed towards the prevention or control of tree diseases. The laboratory is administered by the Forest Biology Division of The Science Service, Department of Agriculture, Canada.



Spreading straw or mulch onto seed bed.

Age Classes

A forest, to produce sustained timber yields, should be made up of trees of all age classes and stages of development from seedlings to mature timber, in such proportions that when one group of

trees is harvested, another is ready to take its place.

The total productive forest area of the Lake Simcoe district is classed as 9 per cent mature, 54 per cent immature, 11 per cent all-aged, 21 per cent young growth, and 5 per cent reproducing forest (table 3, fig. 4).

Patented lands, totalling 425,184 acres, or 88 per cent of the productive forest area, have a similar distribution with 10 per cent mature, 58 per cent immature, 11 per cent all-aged, 18 per cent young growth, and 3 per cent reproducing forest.

On Crown lands, mature forest occupies 5 per cent of the area; immature, 31 per cent; all-aged, 6 per cent; young growth, 40 per cent; and reproducing forest, 18 per cent. Crown lands occupy only 58,470 acres, or 12 per cent of the productive forest area.

TABLE 3.—*Classification of productive forest land into types and age classes.*

Age class and cover type	Crown land	Patented land	Total	
	acres	acres	acres	per cent
Mature forest				
Coniferous	14	1,398	1,412	
Hardwood	2,198	32,170	34,368	7
Mixedwoods	500	8,544	9,044	2
TOTAL	2,712	42,112	44,824	9
Immature forest:				
Coniferous	356	20,604	20,960	4
Hardwood	9,358	133,150	142,508	29
Mixedwoods	8,716	91,176	99,892	21
TOTAL	18,430	244,930	263,360	54
All-aged forest				
Hardwood	968	32,548	33,516	7
Mixedwoods	2,270	15,000	17,270	4
TOTAL	3,238	47,548	50,786	11
Young growth				
Coniferous	158	5,354	5,512	1
Hardwood	21,814	45,804	67,618	14
Mixedwoods	1,450	25,796	27,246	6
TOTAL	23,422	76,954	100,376	21
Reproducing forest				
	10,668	13,640	24,308	5
TOTAL PRODUCTIVE FOREST	58,470	425,184	483,654	100

*Less than one per cent

Regional Forest Types

The Lake Simcoe district lies mainly within the Great Lakes-St. Lawrence Forest Region, although the southwestern section falls in the Deciduous Forest Region. The Great Lakes-St. Lawrence Region is centered on the Great Lakes system. The indicating species are sugar maple and yellow birch. White pine and red maple have a wide distribution, while hemlock and beech are present in much of the region. Within this district, the forests have been greatly modified by settlement, lumbering, and subsequent reforestation.

Separate volume and yield tables are prepared for each region, or section, and they serve as units in the compilation of volume estimates. In the Lake Simcoe district three forest sections are represented (fig. 5) as follows:

1. The Algonquin section includes the three most northerly townships and covers 4 per cent of the area.
2. The Huron section covers almost the entire district, or 88 per cent of the area.
3. The Niagara section occurs in the southwest corner of the district, occupying 8 per cent of the area.

The Algonquin section has a bedrock of crystalline limestones, schists and gneisses of the Precambrian Shield. Topography is rough and irregular with numerous lakes and streams. Glacial deposits, of varied character and a light texture, cover most of the region. It is an area of mixed forest in which sugar maple, yellow birch, hemlock, and white pine predominate. The mature forest is at present almost non-existent, and second growth stands of hardwoods and mixedwoods occupy most of the area. These associations contain a variety of species, but aspen, red oak, soft maple, sugar maple, white oak, basswood, hemlock and white pine occur frequently.

The Huron section is underlain by the Ordovician and Silurian rocks of the Palaeozoic Era. These consist of limestone, shale, sandstone and dolomite, overlain by glacial material which is modified, in part, by wave action and lacustrine deposits. The prevailing association is a broad-leaved forest, in which sugar maple and beech are dominant. Hemlock, white pine, oak, elm, basswood, ash, red maple, hickory, ironwood and black cherry all occur within the association. The area is heavily settled, and the forested area has been both reduced in extent and altered in composition.

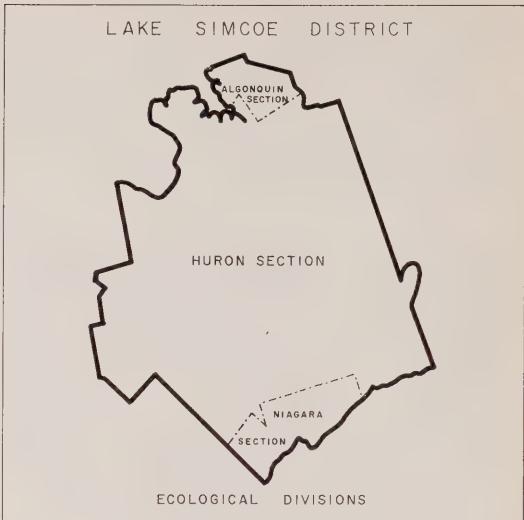


FIGURE 5

The Niagara section is composed predominantly of broad-leaved trees. A large number of species, many of small size, find their northern range here. Within this district, the section occurs in an area that is largely urban. Therefore, the volumes for any forested areas have been calculated from tables for the Huron section.

Forest cover, within these broad regions, is influenced by local climate, together with the soil and rock materials. The following local land forms, or minor physiographic regions¹ (fig. 6), have been recognized:

1. *Niagara Escarpment*. — This escarpment enters the district in Caledon Township and runs northward to the Blue Mountains near Collingwood. The uniform slopes of the escarpment are mantled by morainic deposits which, through much of this section, completely hide it. The slopes are dissected by deep valleys and the easily eroded land is badly gullied.

2. *Horseshoe Moraines*. — The eastern arm of this formation straddles the escarpment. It has two main components, — the irregular, stony knobs and ridges, and the gravel or swamp-floored valleys. The sandy terraces are unconfined by moraine on the east and are badly gullied. The drift and terraces are an important source of gravel.

¹ L. J. Chapman and D. F. Putnam. *The Physiography of Southern Ontario*, University of Toronto Press, 1951.

LAKE SIMCOE DISTRICT



FIGURE 6

3. *Dundalk Till Plain*. — This gently undulating plain is characterized by swamps, bogs, and poorly drained depressions. A superficial silt deposit overlies the pebbly loam. This region has the coolest and shortest growing season of any farming area in Southern Ontario.

4. *Stratford Till Plain*. — A faint knoll and sag relief is apparent on this plain, formed of brown calcareous silty clay.

5. *Hillsburg Sand Hills*. — The characteristic feature is rough topography with flat-bottomed swampy valleys. Fine sands are prevalent, and the soils on the steeper slopes are droughty and erosive.

6. *Guelph Drumlin Field*. — The drumlins are broad and oval with moderate slopes. They are not too closely grouped, and the intervening low ground is occupied by alluvial materials.

7. *Oak Ridges*. — This interlobate moraine extends across the district from the Niagara escarpment to Lake Scugog. It is the divide between the Lake Ontario and Georgian Bay-Trent River drainage systems. Water tends to drain vertically through the sand and gravel and, although it is the source of many streams, there is a lack of water in the moraine. The soil is unstable under cultivation, although the gentler slopes may be pastured and cropped, depending on the slope and texture. Plantations at Vivian demonstrate the effectiveness

of reforestation in stabilizing the hilly, sandy soil which is subject to wind erosion.

8. *South Slopes*. — This moraine contains a variety of soils, some of which are excellent. The shale content increases from east to west and the topography changes from a drumlinized area to a faintly drumlinized till plain in the central portion. The western section, which is morainic, is split by the Peel Plain.

9. *Peel Plain*. — A heavy-textured clay soil occupies this level to undulating tract through which streams have cut deep valleys. Owing to the high degree of evaporation from the clay and the fact that the underlying shales are not good aquifers, the water supply is a problem in this area.

10. *Iroquois Plain*. — This narrow area bordering Lake Ontario is now mainly converted to urban land uses. Varied conditions occur in this section. Ontario County contains drumlins and clay plains; Scarborough Township has high bluffs, standing up to 350 feet above the lake; while a narrow, sloping, well-drained plain — formerly an important horticultural area — occurs west of Toronto.

11. *Schomberg Clay Plains*. — Deep deposits of stratified clay and silt occupy depressions along the northern slope of the Oak Ridges moraine. The largest areas are located near Schomberg, Newmarket, and Lake Scugog. The Scugog area is underlain by a flat till plain, while the two western areas, which are underlain by an incompletely buried, drumlinized till plain, are not as flat as many lake plains.

12. *Peterborough Drumlin Field*. — A wide variety of soil types occur in this area, which is noted for its drumlins and eskers. The till plain is dissected by a series of deep valleys with wide, swampy bottoms and sluggish streams. Utilization of the land is handicapped by steep slopes, stoniness, and wet swampy hollows.

13. *Simcoe Lowlands*. — The western portion draining into Nottawasaga Bay and the eastern section surrounding Lake Simcoe are joined at Barrie by a flat-floored valley. The western part is divided into several distinctive sections: poorly drained flats, sand plains, clay plains, and the sand beaches bordering Georgian Bay. A narrow, bouldery terrace forms the northern and western shores of Lake Simcoe. Cold, wet, subsoils occur in a broad valley which extends fifteen miles south

TABLE 4.—Classification of productive forest lands into cover types.

Cover type and age class	Crown land		Patented land		Total
	acres	per cent	acres	per cent	
Coniferous type:					
Mature.....	14	*	1,398	*	1,412 *
Immature.....	356	1	20,604	5	20,960 5
Young growth.....	158	*	5,354	1	5,512 1
Plantations.....	10,640	18	12,674	3	23,314 5
TOTAL.....	11,168	19	40,030	9	51,198 11
Hardwood type:					
Mature.....	2,198	4	32,170	8	34,368 7
Immature.....	9,358	16	133,150	31	142,508 29
All-aged.....	968	2	32,548	8	33,516 7
Young growth.....	21,814	37	45,804	11	67,618 14
Plantations.....	.....	.....	2	*	2 *
TOTAL.....	34,338	59	243,674	58	278,012 57
Mixedwoods type:					
Mature.....	500	1	8,544	2	9,044 2
Immature.....	8,716	15	91,176	21	99,892 21
All-aged.....	2,270	4	15,000	4	17,270 3
Young growth.....	1,450	2	25,796	6	27,246 6
Plantations.....	.....	.....	.....	.....	.....
TOTAL.....	12,936	22	140,516	33	153,452 32
Reproducing forest.....	28	*	964	*	992 *
TOTAL PRODUCTIVE FOREST.....	58,470	100	425,184	100	483,654 100

*Less than one per cent.

broadleaved trees. All other combinations are classed as mixedwoods. In addition to the three main cover types, there are small areas of recently established natural reproduction that have not yet attained a sufficiently stable composition to be classified into cover types. The artificially established plantations are areas of reproduction which have been classified according to cover type.

The hardwood type occupies 57 per cent of the productive forest land (table 4); the mixedwoods type covers 32 per cent, and the coniferous type only 11 per cent (fig. 7). The distribution on patented land varies only slightly from these figures.

On Crown land, the hardwood type occurs on 59 per cent of the productive forest area, the mixedwoods type on 22 per cent, and the coniferous type on 19 per cent.

Plantations comprise 95 per cent of the coniferous type on Crown land and 32 per cent of this type on

of the lake and forms the Holland Marsh and Queensville flats. Northeast of this area is a low, swampy sand plain, modified at the north by several nearly bare tracts of limestone. North of this again is a clay plain.

14. *Simcoe Uplands.*—The undulating topography is formed by a series of ridges separated by steep-sided, flat-floored valleys. Till is composed mainly of Precambrian rock, and the dominant soil is a well-drained stony, or sandy, loam.

15. *Carden Plain.*—This limestone plain, with little overburden, once supported a good pine forest. Most of the settled land is now utilized as rough pasture.

Cover Types

The forests of the Lake Simcoe district contain 22 native species, or species groups, which occur in sufficient volume to be incorporated into this report. Additional species, such as walnut, butternut, sycamore and hickory, have a very scattered representation and Scots pine, jack pine, European larch and Norway spruce have been introduced in plantations within the district.

The forests of the district are described under three main cover types: coniferous, hardwood, and mixedwoods. The coniferous type is one in which 75 per cent or more of the number of trees are conifer or softwood trees; the hardwood type is composed of 75 per cent or more of hardwood or

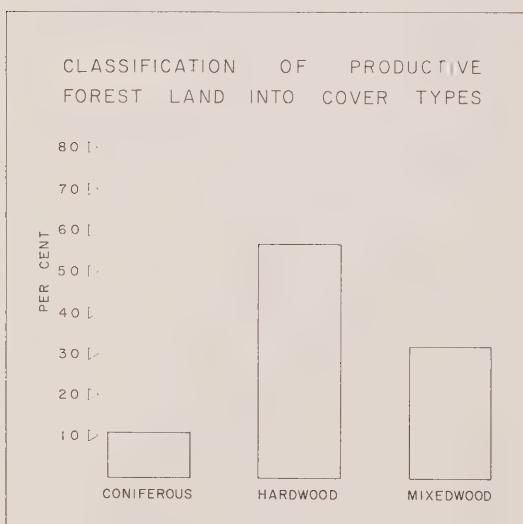


FIGURE 7

patented lands. On Crown lands the principal species planted are the four pines—red, Scots, jack, and white—while smaller quantities of European larch, white and Norway spruce, and white cedar are also planted. Private plantations consist primarily of Scots pine grown for Christmas trees, although relatively small quantities of red, jack, and white pine are also planted.

There are 10,640 acres of coniferous plantations on Crown lands within the district. Plantations on patented land total 12,676 acres, of which two acres have been classified as mixedwood, while the remainder are coniferous.

Volume

The volume of the primary growing stock includes all living trees 3.6 inches d.b.h. outside bark and over which are standing on the productive forest lands of the district; it consists of the wood volume inside bark in cubic feet, including stump and top and cull or defective portions of living trees, but excludes all limb wood.

TABLE 5.—*Volume per acre of the primary growing stock*

	Crown land		Patented land		Average	
	4"-9" 10" up		4"-9" 10" up		10" up	
	d.b.h.	d.b.h. ¹	d.b.h.	d.b.h. ¹	d.b.h.	d.b.h. ¹
Mature	390	985	1,375	366	1,797	2,163
Immature	631	427	1,058	754	461	1,215
All-aged	621	1,105	1,726	627	1,248	1,875
Productive forest	251	241	492	541	583	1,124
						1,047

The volume of the primary growing stock on productive forest lands in the Lake Simcoe district is just over 506 million cubic feet (506,624,000 cubic feet). This is an average of 1,047 cubic feet per acre (table 5). The mature age class contains 94.8 million cubic feet (table 6), or 2,115 cubic feet per acre; the immature age class contains 317.1 million cubic feet, or 1,204 cubic feet per acre; and the all-aged stands contain 94.7 million cubic feet, or 1,866 cubic feet per acre.

Crown lands in the Lake Simcoe district have a total volume just under 29 million cubic feet (table 7), or an average of 492 cubic feet per acre. This low volume is due to the fact that only 42 per cent of the productive forest on Crown lands supports trees of talliable size, 3.6 inches d.b.h. and over. The remaining areas contain artificial or natural

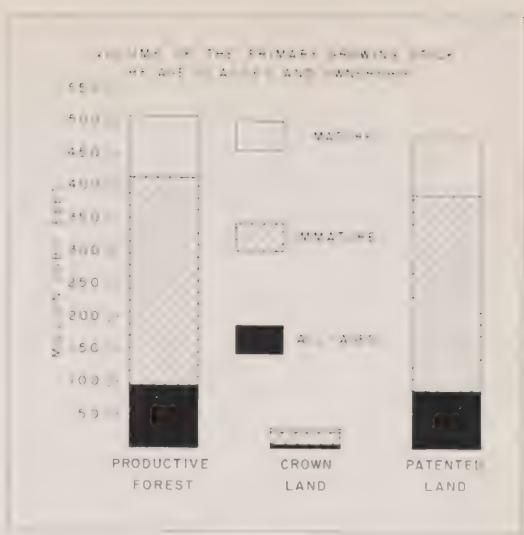


FIGURE 8

regeneration, and young growth that is too small to contribute any volume to the present calculations. The mature age class contains 3.7 million cubic feet, or 1,375 cubic feet per acre; the immature, 19.5 million cubic feet, or 1,058 cubic feet per acre; and the all-aged stands, 5.6 million cubic feet, or 1,726 cubic feet per acre.

Patented lands within the district have a primary growing stock of almost 478 million cubic feet (table 8), averaging 1,124 cubic feet per acre. The mature age class totals 91.1 million cubic feet, or 2,163 cubic feet per acre; the immature age class contains 297.6 million cubic feet, or 1,215 cubic feet per acre; and all-aged stands contain 89.2 million cubic feet (fig. 8), or 1,875 cubic feet per acre.



Sawlog landing on the railway line.

TABLE 6.—Cubic-foot volumes of primary growing stock on productive forest land (Crown plus patented land) in the Lake Simcoe district by species group, age class and cover type in two size classes.

ALL SPECIES										
Cover type	Mature		Immature		All-aged		Total all lands			
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up				
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.		Thou-	sand	cu. ft.
Coniferous	1,042	2,354	21,685	10,902	.....	.....	35,983	Thou-	sand	cu. ft.
Hardwood	11,629	59,664	104,391	63,557	21,129	42,000	302,370	Thou-	sand	cu. ft.
Mixedwoods	3,808	16,321	70,282	46,243	10,702	20,915	168,271	Thou-	sand	cu. ft.
TOTAL	16,479	78,339	196,358	120,702	31,831	62,915	506,624	Thou-	sand	cu. ft.

ALL CONIFERS

ALL CONIFERS										
Cover type	Mature		Immature		All-aged		Total all lands			
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up				
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.		Thou-	sand	cu. ft.
Coniferous	909	1,448	18,467	6,483	.....	.....	27,307	Thou-	sand	cu. ft.
Hardwood	798	2,568	3,716	2,933	902	1,958	12,875	Thou-	sand	cu. ft.
Mixedwoods	1,915	6,002	30,895	15,540	4,517	6,106	64,975	Thou-	sand	cu. ft.
TOTAL	3,622	10,018	53,078	24,956	5,419	8,064	105,157	Thou-	sand	cu. ft.

ALL HARDWOODS

ALL HARDWOODS										
Cover type	Mature		Immature		All-aged		Total all lands			
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up				
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.		Thou-	sand	cu. ft.
Coniferous	133	906	3,218	4,419	.....	.....	8,676	Thou-	sand	cu. ft.
Hardwood	10,831	57,096	100,675	60,624	20,227	40,042	289,495	Thou-	sand	cu. ft.
Mixedwoods	1,893	10,319	39,387	30,703	6,185	14,809	103,296	Thou-	sand	cu. ft.
TOTAL	12,857	68,321	143,280	95,746	26,412	54,851	401,667	Thou-	sand	cu. ft.

TABLE 7.—Cubic-foot volumes of primary growing stock on Crown land in the Lake Simcoe district by species group, age class and cover type in two size classes.

ALL SPECIES										
Cover type	Mature		Immature		All-aged		Total Crown land			
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up				
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.		Thou-	sand	cu. ft.
Coniferous	.....	.....	.....	.....	.....	.....	422	311	111	.....
Hardwood	857	2,044	6,171	3,799	600	1,135	14,606	.....	.....	.....
Mixedwoods	200	628	5,148	3,959	1,410	2,442	13,787	.....	.....	.....
TOTAL	1,057	2,672	11,630	7,869	2,010	3,577	28,815	.....	.....	.....

ALL CONIFERS

ALL CONIFERS										
Cover type	Mature		Immature		All-aged		Total Crown land			
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up				
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.		Thou-	sand	cu. ft.
Coniferous	.....	.....	.....	.....	.....	.....	344	279	65	.....
Hardwood	190	578	359	446	59	130	1,762	.....	.....	.....
Mixedwoods	74	295	2,021	2,731	582	1,252	6,955	.....	.....	.....
TOTAL	264	873	2,659	3,242	641	1,382	9,061	.....	.....	.....

ALL HARDWOODS

ALL HARDWOODS										
Cover type	Mature		Immature		All-aged		Total Crown land			
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up				
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.		Thou-	sand	cu. ft.
Coniferous	.....	.....	.....	.....	.....	.....	78	32	46	.....
Hardwood	667	1,466	5,812	3,353	541	1,005	12,844	.....	.....	.....
Mixedwoods	126	333	3,127	1,228	828	1,190	6,832	.....	.....	.....
TOTAL	793	1,799	8,971	4,627	1,369	2,195	19,754	.....	.....	.....

TABLE 8.—Cubic-foot volumes of primary growing stock on patented land in the Lake Simcoe district by species group, age class and cover type in two size classes.

ALL SPECIES

Cover type	Mature		Immature		All-aged		Total patented
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up	
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	
	Thou- sand cu. ft.	Thou- sand cu.					
Coniferous	1,042	2,354	21,374	10,791	...	...	35,561
Hardwood	10,772	57,620	98,220	59,758	20,529	40,865	287,764
Mixedwoods	3,608	15,693	65,134	42,284	9,292	18,473	154,484
TOTAL	15,422	75,667	184,728	112,833	29,821	59,338	477,800

ALL CONIFER

Cover type	Mature		Immature		All-aged		Total patented
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up	
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	
	Thou- sand cu. ft.	Thou- sand cu.					
Coniferous	909	1,448	18,188	6,418	...	...	26,963
Hardwood	608	1,990	3,357	2,487	843	1,828	11,113
Mixedwoods	1,841	5,707	28,874	12,809	3,935	4,854	58,020
TOTAL	3,358	9,145	50,419	21,714	4,778	6,682	96,096

ALL HARDWOOD

Cover type	Mature		Immature		All-aged		Total patented
	4"-9"	10" up	4"-9"	10" up	4"-9"	10" up	
	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	d.b.h.	
	Thou- sand cu. ft.	Thou- sand cu. ft.	Thou- sand cu. ft.	Thou- sand cu. ft.	Thou- sand cu. ft.	Thou- sand cu. ft.	Thou- sand cu.
Coniferous	133	906	3,186	4,373	...	...	8,598
Hardwood	10,164	55,630	94,863	57,271	19,686	39,037	276,051
Mixedwoods	1,767	9,986	36,260	29,475	5,357	13,619	96,464
TOTAL	12,064	66,522	134,309	91,119	25,043	52,656	381,713



Working the survey plots

Species

Within the Lake Simcoe district the hardwood species total 401 million cubic feet (table 9), or 79 per cent of the volume, and the coniferous species total 105 million cubic feet, or 21 per cent of the volume.

Nine species form 82 per cent of the volume on productive forest land (fig. 9). The principal species within the district is sugar maple, which comprises 22 per cent of the total growing stock. It is followed by elm with 13 per cent, poplar 13 per cent, white cedar 10 per cent, soft maple 6 per cent, white birch and beech with 5 per cent each, and hemlock and white pine with 4 per cent each. Thirteen species form the remaining 18 per cent of the total growing stock.

VOLUME OF THE PRIMARY GROWING STOCK ON PRODUCTIVE FOREST LANDS BY SPECIES AND AGE CLASSES

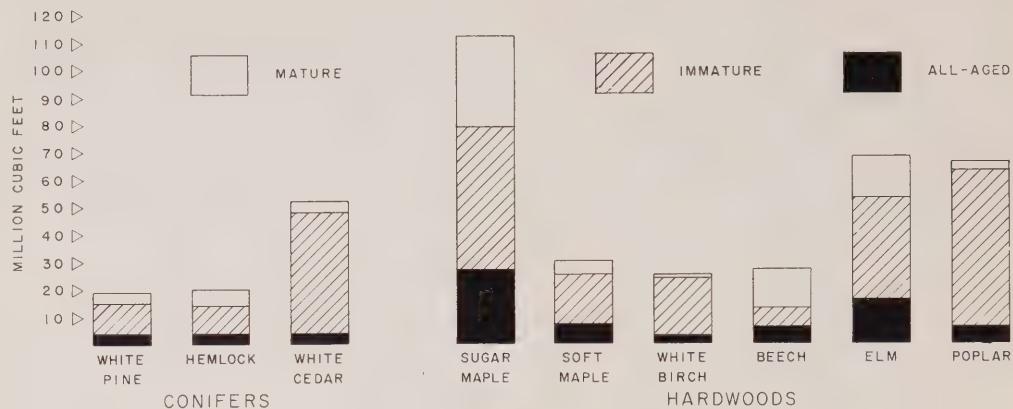


FIGURE 9

In the mature age class three species — sugar maple 35 per cent, beech and elm 15 per cent each — form 65 per cent of the volume. Four species make up 61 per cent of the immature volume; poplar 18 per cent, sugar maple 17 per cent, white cedar 14 per cent, and elm 12 per cent. In the all-aged stands, sugar maple forms 28 per cent of the volume and elm 17 per cent.

Crown lands have almost 29 million cubic feet (table 10), of which 31 per cent is made up by conifers and 69 per cent by hardwoods. The principal species are poplar and white pine, each of which forms 22 per cent of the total volume. These two species are the principal components in all age classes, followed by red oak and sugar maple in the mature and immature stands, and by red oak and hemlock in the all-aged stands.

Patented lands, which support 94 per cent of the wood volume in the district, have 96 million cubic feet of conifers and 382 million cubic feet of hardwoods (table 11). Sugar maple, elm, poplar, and white cedar are the principal species on patented lands. Sugar maple forms 36 per cent of the mature age class, followed by elm 16 per cent and beech 15 per cent. Four species, sugar maple, poplar, white cedar, and elm, form 60 per cent of the immature volume. In the all-aged stands, sugar maple comprises 30 per cent of the volume and elm 18 per cent.

Size Class Relationship

In compiling the inventory, volumes of the primary growing stock are shown for two size classes, the smaller material from 4-9 inches d.b.h. and the larger trees 10 inches d.b.h. and over. Volumes in trees 4 to 9 inches d.b.h. are considered as pulpwood and cordwood material, depending on species, although products such as posts, poles and railway ties may be obtained from this size class. Volumes in

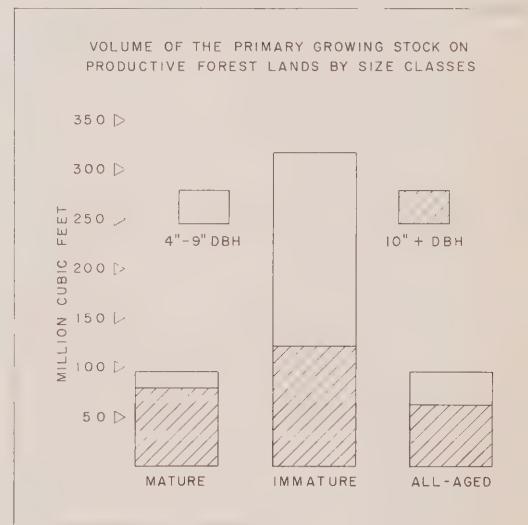


FIGURE 10

TABLE 9.—Cubic-foot volumes of primary growing stock on productive forest land in the Lake Simcoe district by species and age class in two size classes.

Species	Mature		Immature		All-aged		Total all lands
	4"-9" d.b.h.	10" up d.b.h.	4"-9" d.b.h.	10" up d.b.h.	4"-9" d.b.h.	10" up d.b.h.	
White pine	489	3,154	3,192	7,938	744	3,348	18,895
Red pine	5	.....	56	43	13	40	157
White spruce	10	44	1,528	1,165	75	95	2,917
Black spruce	.....	.....	78	.....	.....	.....	78
Balsam fir	112	61	7,099	995	543	74	8,884
Hemlock	1,214	4,353	4,563	5,660	1,606	2,927	20,323
White cedar	1,791	2,381	34,929	8,616	2,362	1,532	51,611
Larch	1	25	1,633	539	46	48	2,292
TOTAL CONIFERS	3,622	10,018	53,078	24,956	5,419	8,064	105,157
Sugar maple	5,778	27,379	33,593	18,936	10,621	16,223	112,530
Soft maple	856	3,654	11,521	6,965	2,606	4,602	30,204
White birch	804	495	17,001	3,883	1,237	1,272	24,692
Yellow birch	616	1,434	4,319	3,591	874	1,286	12,120
Beech	869	12,975	2,702	4,143	1,200	4,657	26,546
Elm	1,405	13,058	13,624	23,656	3,183	13,122	68,048
Ironwood	460	260	2,552	322	654	122	4,370
Red oak	344	974	6,162	3,645	832	2,587	14,544
White oak	160	299	1,102	460	288	327	2,636
Poplar	445	2,480	36,744	19,737	1,927	4,483	65,816
Black ash	410	419	6,296	1,301	1,178	726	10,330
White ash	226	1,549	2,741	2,487	678	1,944	9,625
Basswood	332	3,096	3,148	5,869	882	3,089	16,416
Black cherry	152	249	1,775	751	252	411	3,590
TOTAL HARDWOODS	12,857	68,321	143,280	95,746	26,412	54,851	401,467
TOTAL ALL SPECIES	16,479	78,339	196,358	120,702	31,831	62,915	506,624

the 10-inch and over size class have values for sawlogs and other uses where large timber is required. A tree 10 inches d.b.h. outside bark will, on the average, produce one log sixteen feet long, 8 inches in diameter inside bark at the small end. In addition there is residual smaller-size material in the top which may be used as pulpwood or for purposes other than saw timber. The total quantity of wood in this residual top is relatively small, and is included in the 10 inches and over material in all inventory estimates.

The 4 to 9-inch d.b.h. class contains 48 per cent of the volume of the primary growing stock in the Lake Simcoe district, and the 10-inch and over class contains 52 per cent. Of the coniferous volume, 62 million cubic feet, or 59 per cent, is in the smaller size class and 43 million cubic feet, or 41 per cent,

TABLE 10.—Cubic-foot volumes of primary growing stock on Crown land in the Lake Simcoe district by species and age class in two size classes.

Species	Mature		Immature		All-aged		Total Crown land
	4"-9" d.b.h.	10" up d.b.h.	4"-9" d.b.h.	10" up d.b.h.	4"-9" d.b.h.	10" up d.b.h.	
White pine	211	790	1,244	2,786	237	983	6,251
Red pine	2	.....	31	24	7	23	87
White spruce	.....	1	1	21	16	5	52
Black spruce	.....	.....	72	.....	.....	.....	72
Balsam fir	2	1	367	32	140	1	543
Hemlock	26	56	415	270	219	341	1,327
White cedar	23	25	456	107	32	24	667
Larch	.....	.....	53	7	1	1	62
TOTAL CONIFERS	264	873	2,659	3,242	641	1,382	9,061
Sugar maple	55	253	1,094	578	177	277	2,434
Soft maple	19	42	664	278	223	229	1,455
White birch	268	5	1,136	120	153	80	1,762
Yellow birch	6	16	146	124	27	37	356
Beech	91	118	72	99	33	98	429
Elm	13	121	377	559	25	86	1,181
Ironwood	42	2	114	7	20	1	186
Red oak	165	203	1,370	659	247	465	3,109
White oak	86	111	469	184	113	113	1,076
Poplar	110	879	2,886	1,601	226	633	6,335
Black ash	4	4	231	62	22	5	328
White ash	2	14	105	68	4	10	203
Basswood	3	29	268	271	93	159	823
Black cherry	11	2	39	17	6	2	77
TOTAL HARDWOODS	793	1,799	8,971	4,627	1,369	2,195	19,754
TOTAL ALL SPECIES	1,057	2,672	11,630	7,869	2,010	3,577	28,815

is in the larger size class. Hardwoods have 182 million cubic feet in the 4 to 9-inch group and 219 million cubic feet, or 55 per cent, in the 10-inch and over group (table 9). The 10-inch and over class contains 83 per cent of the mature, 38 per cent of the immature, and 66 per cent of the all-aged volume (fig. 10).

The volume on Crown lands is almost equally divided between the two size classes with 51 per cent in the 4 to 9-inch class and 49 per cent in the 10-inch and over class. The mature stands have 72 per cent and the all-aged stands 64 per cent of their volume in the larger size class, while 60 per cent of the immature volume occurs in the 4 to 9-inch class (table 10). Conifers have 61 per cent of their volume in the sawlog class, while only 44 per cent of the hardwood volume occurs in this larger size class.

TABLE 11.—Cubic-foot volumes of primary growing stock on patented land in the Lake Simcoe district by species and age class in two size classes.

Species	Mature		Immature		All-aged		Total patented land
	4"-9" d.b.h.	10" up d.b.h.	4"-9" d.b.h.	10" up d.b.h.	4"-9" d.b.h.	10" up d.b.h.	
White pine	278	2,364	1,948	5,152	537	2,365	12,644
Red pine	3	.....	25	19	6	17	70
White spruce	10	43	1,507	1,149	70	86	2,865
Black spruce	.....	.....	6	.....	.....	.....	6
Balsam fir	110	60	6,732	963	403	73	8,341
Hemlock	1,188	4,297	4,148	5,390	1,387	2,586	18,996
White cedar	1,768	2,356	34,473	8,509	2,330	1,508	50,944
Larch	1	25	1,580	532	45	47	2,230
TOTAL CONIFERS	3,358	9,145	50,419	21,714	4,778	6,682	96,096
Sugar maple	5,723	27,126	32,499	18,358	10,444	15,946	110,096
Soft maple	837	3,612	10,857	6,687	2,383	4,373	28,749
White birch	536	490	15,865	3,763	1,084	1,192	22,930
Yellow birch	610	1,418	4,173	3,467	847	1,249	11,764
Beech	860	12,857	2,630	4,044	1,167	4,559	26,117
Elm	1,392	12,937	13,247	23,097	3,158	13,036	66,867
Ironwood	418	258	2,438	315	634	121	4,184
Red oak	179	771	4,792	2,986	585	2,122	11,435
White oak	74	188	633	276	175	214	1,560
Poplar	335	1,601	33,858	18,136	1,701	3,850	59,481
Black ash	406	415	6,065	1,239	1,156	721	10,002
White ash	224	1,535	2,636	2,419	674	1,934	9,422
Basswood	329	3,067	2,880	5,598	789	2,930	15,593
Black cherry	141	247	1,736	734	246	409	3,513
TOTAL HARDWOODS	12,064	66,522	134,309	91,119	25,043	52,656	381,713
TOTAL ALL SPECIES	15,422	75,667	184,728	112,833	29,821	59,338	477,809

The immature age class contains 68 per cent of the volume on Crown lands. White pine and poplar are the principal species in this age class, and while 69 per cent of the pine volume occurs within the sawlog size class, only 36 per cent of the poplar volume produces material of sawlog size. Of the other principal species, only elm produces predominantly sawlog material, with 60 per cent of its volume in this size class. Basswood is evenly distributed between the two size classes. The 4 to 9-inch d.b.h. group contains 61 per cent of the hemlock, 81 per cent of the white cedar, 65 per cent of the sugar maple, 70 per cent of the soft maple, 90 per cent of the white birch, 68 per cent of the red oak and 72 per cent of the white oak volume (fig. 11).

On patented lands in the Lake Simcoe district,

52 per cent of the volume occurs in the 10-inch and over d.b.h. group. This size class contains 83 per cent of the mature volume, 67 per cent of the volume in all-aged stands, but only 38 per cent of the immature volume. Conifers have nearly 59 million cubic feet, or 61 per cent of their volume, in the 4 to 9-inch group and hardwoods have 210 million cubic feet, or 55 per cent of their volume, in the 10-inch and over class (table 11).

Of the principal conifers on patented lands, white pine and hemlock produce predominantly sawlog material, while balsam fir and white cedar have most of their volume in the smaller size class. The 10-inch and over d.b.h. class contains 89 per cent of the mature white pine, 73 per cent of the immature and



VOLUME OF THE PRIMARY GROWING STOCK OF THE PRINCIPAL SPECIES IN
THE IMMATURE AGE CLASS ON CROWN LANDS BY SIZE CLASSES

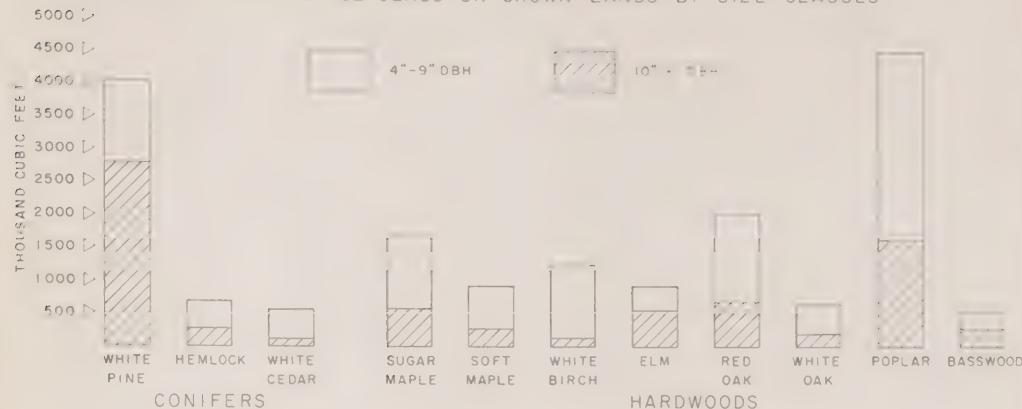


FIGURE 11

81 per cent of the all-aged volume. Hemlock has 78 per cent of the mature, 57 per cent of the immature and 65 per cent of the all-aged volume in this size class. Sixty-five per cent of the mature balsam fir volume, 87 per cent of the immature and 85 per cent of the all-aged occurs in the 4 to 9-inch d.b.h. group. Only 43 per cent of the mature white cedar occurs in the 4 to 9-inch class, but 80 per cent of the immature and 61 per cent of the all-aged volume occur in this size class (fig. 12).

Hardwoods in the mature age class on patented lands produce mainly sawlog material. Only two species, white birch and ironwood, have most of their volume in the cordwood class. The principal hardwood species, sugar maple, elm and beech, have 83, 90 and 94 per cent of their respective volumes in the 10-inch and over size class. This class also contains 81 per cent of the soft maple, 70 per cent of the yellow birch and 90 per cent of the basswood volume (fig. 13).

VOLUME OF THE PRIMARY GROWING STOCK OF THE PRINCIPAL CONIFEROUS
SPECIES ON PATENTED LANDS BY AGE CLASSES AND SIZE CLASSES

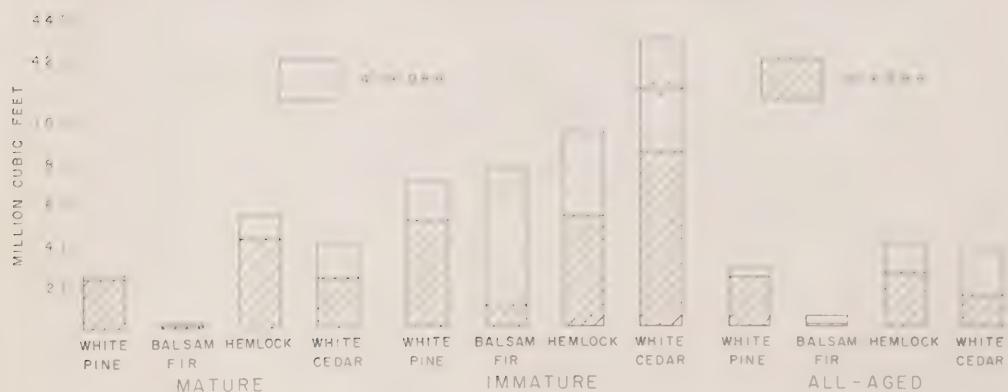


FIGURE 12

VOLUME OF THE PRIMARY GROWING STOCK OF THE PRINCIPAL HARDWOOD SPECIES IN THE MATURE AGE CLASS ON PATENTED LANDS BY SIZE CLASSES

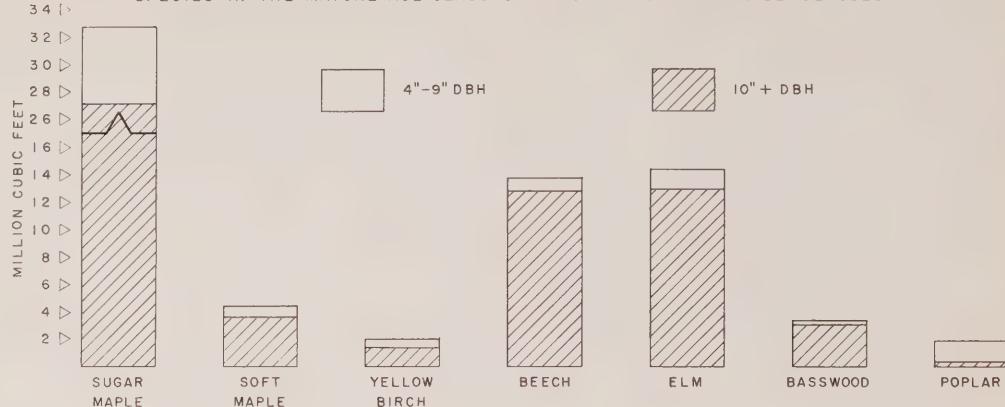


FIGURE 13

Five species contain 78 per cent of the immature hardwood volume on patented lands. Of these five, only elm, with 64 per cent of its volume in the 10-inch and over d.b.h. group, produces mainly sawlog material. The other four species all have the greatest percentage of their volume in the 4 to 9-inch class: hard maple 64 per cent, soft maple 62 per cent, white birch 81 per cent, and poplar 65 per cent (fig. 14). Beech and basswood are the only other

species in this age class that produce mainly sawlog material.

In the all-aged stands on patented lands only black ash and ironwood have the greater part of their volume in the smaller size class. Of the principal species, beech and elm each have 80 per cent of their volume in all-aged stands in the sawlog size class, poplar has 69 per cent, soft maple 65 per cent, sugar maple 60 per cent, basswood 79 per cent and red oak 78 per cent (fig. 15).

VOLUME OF THE PRIMARY GROWING STOCK OF THE PRINCIPAL HARDWOOD SPECIES IN THE IMMATURE AGE CLASS ON PATENTED LANDS BY SIZE CLASSES

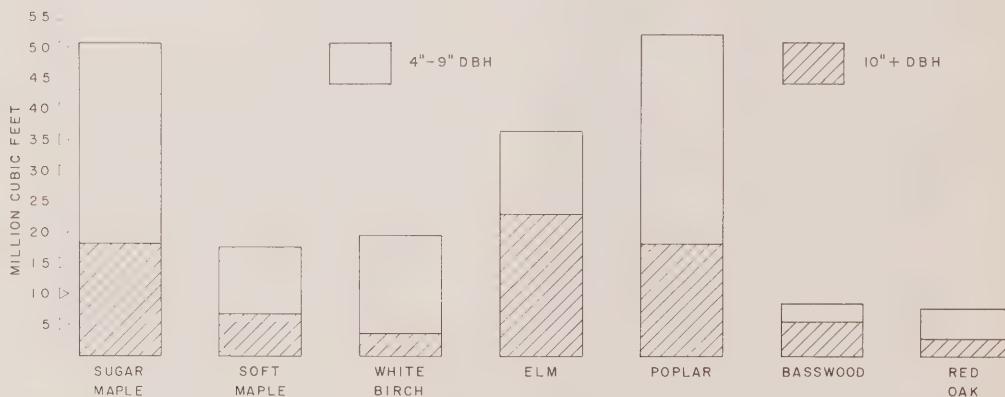


FIGURE 14

VOLUME OF THE PRIMARY GROWING STOCK OF THE PRINCIPAL HARDWOOD SPECIES
IN THE ALL-AGED STANDS ON PATENTED LANDS BY SIZE CLASSES

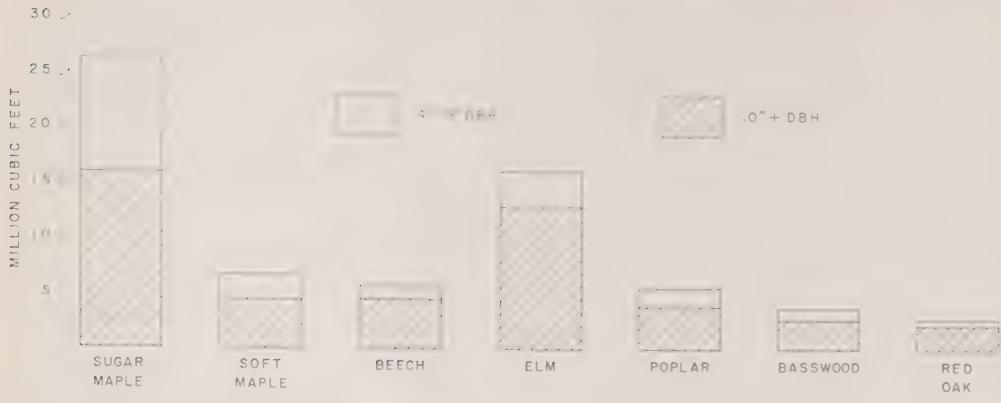


FIGURE 15

Allowable Cut

The allowable cut has been computed for each species with the aid of a volumetric formula¹ and appropriate rotation² for the species. Thus the amount of the allowable cut results from the volume of the primary growing stock and the rotation age adopted for each species encountered in the district.

The calculation of allowable cut, based on the present volume of the primary growing stock, is of value for a period of about ten years. The size and structure of the primary growing stock, upon which the allowable cut calculations are based, changes from year to year, owing to woods operations and growth of the stands. Because of this, the allowable cut should be recalculated on expiration of the initial ten-year period. With effective forestry practices, allowable cuts for the valuable species will increase; without them the proportion of less desirable species in the stands will grow greater.

The annual allowable cut, or net depletion permissible under management in the Lake Simcoe district, is 12,823,640 cubic feet: 119,575 cubic feet from Crown lands and 12,704,065 cubic feet from patented lands. Of the total allowable cut, 99 per cent is on patented lands.

TABLE 12.—*Annual allowable cut for all species on Crown lands in the Lake Simcoe district.*

Species	Annual allowable cut cu. ft.
White pine	25,025
Red pine	60
White spruce	30
Balsam fir	100
Hemlock	820
White cedar	720
TOTAL CONIFERS	26,755
Sugar maple	4,620
Soft maple	2,615
White birch	10,235
Yellow birch	440
Beech	1,905
Elm	2,680
Ironwood	1,320
Red oak	5,520
White oak	1,970
Poplar	59,340
Black ash	240
White ash	480
Basswood	1,065
Black cherry	390
TOTAL HARDWOODS	92,820
TOTAL ALL SPECIES	119,575

CROWN LAND

The annual allowable cut for Crown land represents only 0.4 per cent of the primary growing stock, or 2.1 cubic feet per acre for the productive forest area. Coniferous species comprise 26,755 cubic feet, or 22 per cent, of the total allowable

¹ Method of calculation of allowable cut is given in Appendix, methods, allowable cut, page 31.

² Rotation, by species, table 15, page 31.

cut; and hardwood species (table 12) total 92,820 cubic feet, or 78 per cent of the allowable cut.

The allowable cut for Crown lands was based on the mature areas which account for only 5 per cent of the productive forest land. The remaining areas, consisting of immature stands, young growth, and plantations, are being managed so as to increase the quantity and quality of the present growing stock, and so have not been included in the present allowable cut calculations. Thinning operations in these stands will produce a relatively small volume of timber that is not included in the allowable cut calculations.

In the present calculation of allowable cut on Crown lands three species comprise 79 per cent of the cut: poplar 50 per cent, white pine 21 per cent, and white birch 8 per cent.

PATENTED LAND

The annual allowable cut for patented lands is 12,704,065 cubic feet (table 13). This represents 2.7 per cent of the primary growing stock, or 29.9 cubic feet per acre for the productive forest land. The annual allowable cut is 1.9 per cent of the primary growing stock for conifers and 2.8 per cent for hardwoods. Coniferous species comprise 15 per cent of the allowable cut and hardwoods 85 per cent.

Four species comprise 92 per cent of the coniferous

TABLE 13.—*Annual allowable cut for all species on patented lands in the Lake Simcoe district.*

Species	Annual allowable cut cu. ft.
White pine	263,415
Red pine	2,185
White spruce	89,530
Black spruce	125
Balsam fir	260,655
Hemlock	237,450
White cedar	955,200
Larch	55,750
TOTAL CONIFERS	1,864,310
Sugar maple	2,064,300
Soft maple	1,347,610
White birch	716,560
Yellow birch	183,810
Beech	326,460
Elm	1,253,755
Ironwood	78,450
Red oak	214,405
White oak	19,500
Poplar	3,717,560
Black ash	187,535
White ash	176,660
Basswood	487,280
Black cherry	65,870
TOTAL HARDWOODS	10,839,755
TOTAL ALL SPECIES	12,704,065

allowable cut: white cedar 51 per cent, white pine 14 per cent, balsam fir 14 per cent and hemlock 13 per cent.

Seventy-seven per cent of the hardwood allowable cut is contributed by four of the fourteen hardwood

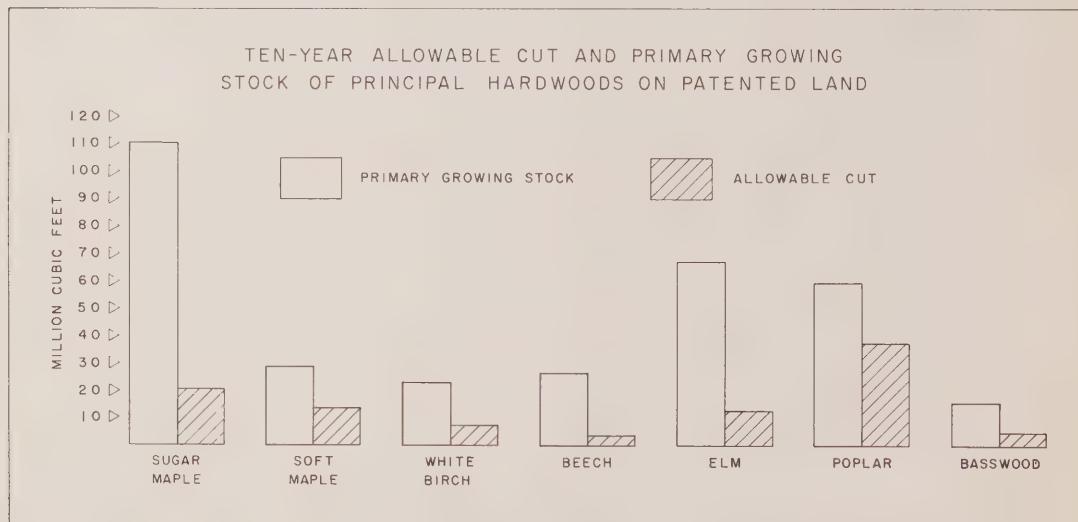


FIGURE 16



Tractor pulling transplanted seedlings for weed control.

species. Poplar forms 34 per cent of the allowable cut, sugar maple 19 per cent, soft maple 12 per cent and elm 12 per cent. Figure 16 graphically illustrates the relationship of the allowable cut for a ten-year period to the volume of the primary growing stock for hardwoods.

Utilization vs. Allowable Cut

No statistics relating to the annual cut of timber on Crown lands in the Lake Simcoe district are collected by the Department of Lands and Forests. This district is essentially an area of privately owned land for which data pertaining to timber production is not readily available. The volume and value of products produced from farm woodlots in 1950¹ is as follows:

Fuelwood	1,651
Pulpwood	1,3
Posts	886
Logs	3,513.755
Poles	2,115.980

The above products, plus maple syrup and maple sugar, were estimated¹ to have a value of \$703,748.

Most of the products were utilized directly on the farm, but sufficient were sold to produce a cash income to the farmers of some \$280,406. These data do not include the number or value of Christmas trees sold from private lands.

TABLE 14. — *Gross total cubic-foot volume of wood produced from patented land in one year in the Lake Simcoe district*

Fuelwood	10,426.245
Pulpwood	25.350
Posts	2,252,435
Logs	2,489.530
Poles	60,200
	15,253,760

By the use of appropriate converting factors, these wood volumes are expressed in gross total cubic feet (table 14). Since these volumes can not be separated by species, no detailed comparison of actual and allowable cut is possible. A comparison of the total actual cut with the total allowable cut indicates that patented lands are being overcut annually by some 2,549,695 cubic feet.

¹ Census of Canada, 1951, Volume V!

APPENDIX

Survey Methods

- The forest resources inventory for the Province of Ontario was carried out by the Aerial Photographic Method. Photographs were taken from a height of 7,920 feet above mean ground level with a six-inch focal length camera to produce photographs on a scale of four inches to the mile (1/15840). Following the photography, semi-controlled photo maps were prepared.

A photo map, or aerial mosaic, is an assembly of individual aerial photographs fitted together systematically to form a composite view of the entire area covered by the photographs. In Southern Ontario a photo map covers 7'30" of latitude and 15' of longitude—approximately one hundred square miles. A six-digit index related to latitude and longitude permits the ready location of any photo map.

In constructing a photo map, the prints are mounted on a hard surface non-porous board, such as masonite, upon which control points have been plotted. The road network of Southern Ontario has been used to control the scale of the photo maps. To prepare a print for mounting, the central portion is cut out in an irregular shape and the edges feathered to produce a margin thinner than the remainder of the print. The technique of feathering the edges ensures smoothness as layers of prints are mounted, and makes the edges of the prints less perceptible to the eye and the camera. After a liberal application of adhesive the print is oriented on to the control and adjusted to coincide with the detail on adjacent photographs. Upon completion of the mosaic, necessary data are printed on the mosaic in white ink. In order to reduce the inherent instability of the photo map to a minimum, and to avoid checks and other disfigurations, it is photographed as soon as possible after completion. Because of the size of the mosaic it is photographed in two sections, producing an east and west half for each sheet. Upon production of the negative, prints are readily available.

Interpretation of forest types was carried out on stereoscopic pairs of photographs, and the data were then transferred to the mosaic. Forest data were drafted on a linen overlay, and the ozalid prints of this comprise the forest type maps of this area.

Systematic sampling was carried out by field crews who collected all the data necessary for making volume estimates. Photographs were taken during the summers of 1953, 1954, 1955 and 1956, and field sampling was carried out in the summer and autumn of 1956. On the completion of the field work, finished forest type maps were prepared and areas determined by the usual methods¹.

Volume estimates were prepared for type aggregates. For this purpose, types were classified into three cover types: coniferous, hardwood, and mixed-woods. These were separated into three age classes: mature, immature and all-aged. The volume per acre for each cover type for the mature and immature age classes was then summarized from the field tallies into three density classes. The all-aged stands were not segregated into density classes. Summaries were made separately for two ecological sections in the Lake Simcoe district. The per acre volumes in cubic feet, made up in this manner, are shown in tables 16 and 17. Table 17 was also applied to the small forested area occurring within the Niagara ecological section.

Mean Annual Increment

The mean annual increment to the rotation age was calculated by dividing the total mature volume for each species by the respective rotation age. The results were totalled and the sum divided by the area of the mature age class.

The mean annual increment to the rotation age for Crown lands amounts to 15 cubic feet per acre, and for patented lands to 23 cubic feet per acre. These figures should be regarded as approximate, since no age class other than the mature was considered in the calculations.

Age Classes

The age classes in their present form do not permit of the usual method of arriving at sustained yield, because there are no figures for areas by species. The immature age class may have an age range from 10 to 120 years and the mature age class from 30 to 300 years, depending on the species. Stands

¹ A complete statement of the methods used in the forest resources inventory is contained in the Manual of Timber Management, Department of Lands and Forests, Ontario, Parts II and III.

classed as all-aged contain trees that range in age through all the age classes recognized in this report. Therefore, the normal area for each age class cannot be obtained.

Rotation

In view of the absence of local studies on maturity of stands, the mature age figures shown in Class Ib¹ were used as rotation ages for each species encountered. In addition, the rotation age of one hundred years has been adopted arbitrarily for the miscellaneous hardwood species (table 15).

Allowable Cut

(a) METHOD

The following two bases were available for calculation of the allowable cut: (1) the volumes of the mature, immature and all-aged stands for each species, and (2) the adopted rotations.

The compilation was carried out in such a way that volumes were shown by species. This suggests the calculation of allowable cut by individual species, separately, rather than for the total primary growing stock in the district, and the method of calculation most suitable to the available data is a volumetric formula.

In view of this, the "French Method of 1883"² was considered and found to be satisfactory for the following reasons: 1. The ratio of the volume per acre of mature to immature age class was found to be approximately 5/3 as required by the French method. 2. The French method is recognized as sound enough, though not entirely free from those disadvantages normally connected with the volumetric methods of regulating yield. The method tends to build up a normal growing stock, and the results of the calculations may be considered rather conservative.

(b) FORMULA

In the present calculations, the following formulae were used:

$$(1) \text{ Crown land: } P = \frac{V_1}{n \cdot 3}$$

$$5 \cdot 8 (V_1 + V_2 + V_3)$$

$$(2) \text{ Patented land: } P = \frac{V_1}{3}$$

TABLE 15. — *Rotation by species.*

Species	Crown land years	Patented land years
White pine	120	90
Red pine	100	60
White spruce	100	60
Black spruce	120	90
Balsam fir	90	60
Hemlock	300	150
White cedar	200	100
Larch	100	75
Sugar maple	200	100
Soft maple	70	40
White birch	80	60
Yellow birch	150	120
Beech	200	150
Elm	150	100
Ironwood	100	100
Red oak	200	100
White oak	300	150
Poplar	50	30
Black ash	100	100
White ash	100	100
Basswood	90	60
Black cherry	100	100

where:

V₁. — denotes volume of mature timber (Age Class I).

V₂. — denotes volume of immature timber (Age Class II).

V₃. — denotes volume of mature and immature timber in all-aged stands.

n — denotes rotation.

P — denotes annual allowable cut.

The decision to use formula (1) for Crown lands was made for the following reasons. The area of mature stands in the Lake Simcoe district is only 5 per cent of the productive forest area, which indicates a deficit of mature timber and, consequently, need of reducing the annual cut. Cutting of immature timber on Crown lands to regulate yield is not indicated inasmuch as it is the practice in Ontario to limit utilization on Crown lands to mature timber. Within this district, areas classed as Crown lands consist of County Forests under agreement and areas, largely in Baxter, Wood, Matchedash and Orillia Townships, where the soil is thin and rocky. In both cases the present aim is to build up the growing stock in the immature stands. In accordance with the foregoing, formula (1) was used in the calculation of the annual allowable cut for Crown lands, whereby only mature timber shall be cut during the initial period, on expiration of which a new mature stand will become available for utilization.

Patented lands present a different problem, requiring a separate solution, thus the choice of formula (2). These lands have a higher proportion of mature area, but the bulk of the forest land is still in the younger age classes. It is reasonable to assume that with a high population and a heavy

¹ Manual of Timber Management, Department of Lands and Forests, Ontario, Part II, page 50.

² Le Pardé — Traité pratique d'aménagement des forêts. Paris, 1930.

demand for wood, this demand will be met by utilizing a portion of the immature stands on patented lands. For this reason both mature and immature volumes were included in the calculations of allowable cut for patented lands with the aim of obtaining a balanced yield over a period of approximately two-thirds of the rotation.

With the aid of the above formulae, the allowable cut has been calculated for each species, separately, with full consideration of the actual growing stock of each species and the appropriate rotation. The results of individual calculations for each species have been totalled and shown as allowable cut for Crown lands and for patented lands, respectively.



Seedlings are placed in transplant beds, using Yale transplanting board.

Common and Botanical Names of Tree Species

Included in Timber Estimates

CONIFERS

White pine.....	<i>Pinus Strobus L.</i>
Red pine.....	<i>Pinus resinosa Ait.</i>
Jack pine.....	<i>Pinus Banksiana Lamb.</i>
Scots pine.....	<i>Pinus sylvestris L.</i>
White spruce.....	<i>Picea glauca (Moench) Voss</i>
Black spruce.....	<i>Picea mariana (Mill.) BSP.</i>
Norway spruce.....	<i>Picea abies (L.) Karst.</i>
Balsam fir.....	<i>Abies balsamea (L.) Mill.</i>
Hemlock.....	<i>Tsuga canadensis (L.) Carr.</i>
White cedar.....	<i>Thuja occidentalis L.</i>
Eastern larch.....	<i>Larix laricina (Du Roi) K. Koch</i>
European larch.....	<i>Larix decidua Mill.</i>

HARDWOODS

Sugar maple.....	<i>Acer saccharum Marsh.</i>
Soft maple.....	<i>Acer rubrum L.</i> <i>Acer saccharinum L.</i>
White birch.....	<i>Betula papyrifera Marsh.</i>
Yellow birch.....	<i>Betula lutea Michx. f.</i>
Beech.....	<i>Fagus grandifolia Ehrh.</i>
Elm.....	<i>Ulmus americana L.</i> <i>Ulmus rubra Muhl.</i> <i>Ulmus Thomasi Sarg.</i>
Ironwood.....	<i>Ostrya virginiana (Mill.) K. Koch</i>
Red oak.....	<i>Quercus rubra L.</i>
White oak.....	<i>Quercus alba L.</i> <i>Quercus macrocarpa Michx.</i> <i>Quercus bicolor Willd.</i>
Poplar.....	<i>Populus tremuloides Michx.</i> <i>Populus balsamifera L.</i> <i>Populus grandidentata Michx.</i> <i>Populus deltoides Marsh.</i>
Black ash.....	<i>Fraxinus nigra Marsh.</i>
White ash.....	<i>Fraxinus americana L.</i> <i>Fraxinus pennsylvanica Marsh.</i> <i>Var. subintegerrima (Vahl) Fern.</i>
Basswood.....	<i>Tilia americana L.</i>
Black cherry.....	<i>Prunus serotina Ehrh.</i>
Walnut.....	<i>Juglans nigra L.</i>
Butternut.....	<i>Juglans cinerea L.</i>
Hickory.....	<i>Carya ovata (Mill.) K. Koch</i> <i>Carya cordiformis (Wang) K. Koch</i>
Sycamore.....	<i>Platanus occidentalis L.</i>

TABLE 16. — *Volume of the primary growing stock in cubic feet per acre.*
Algonquin Section — 1956

SPECIES	D.B.H.	CONIFEROUS MATURE (C-I)			CONIFEROUS IMMATURE (C-II)			ALL-AGED	
		DENSITY CLASS			DENSITY CLASS				
		1 cu. ft.	2 cu. ft.	3 cu. ft.	1 cu. ft.	2 cu. ft.	3 cu. ft.		
White pine	4"-9" 10" up	...	...	...	37.1	31.5	20.3	
Black spruce	4"-9" 10" up	...	...	...	739.9	628.2	404.1	
Larch	4"-9" 10" up	...	...	...	283.0	240.3	154.6	
TOTAL CONIFERS	4"-9" 10" up	...	...	...	1060.0	900.0	579.0	
TOTAL HARDWOODS	4"-9" 10" up	...	...	...	...	...	...
GRAND TOTAL	4"-9" 10" up	...	...	...	1060.0	900.0	579.0	
TOTAL 4" UP	4"-9" 10" up	...	...	...	1060.0	900.0	579.0	
HARDWOODS MATURE (H-I)									
White pine	4"-9" 10" up	147.4 446.8	133.3 404.4	94.0 285.1	39.1 67.2	33.6 57.8	21.6 37.1	HARDWOODS ALL-AGED	
Balsam fir	4"-9" 10" up	...	...	...	3.1	2.7	1.7	54.2 139.7
Hemlock	4"-9" 10" up	...	...	...	28.9 35.2	24.9 30.2	16.0 19.4	9.5
White cedar	4"-9" 10" up	...	...	...	1.6	1.3	0.9	3.5 10.3
TOTAL CONIFERS	4"-9" 10" up	147.4 446.8	133.3 404.4	94.0 285.1	72.7 102.4	62.5 88.0	40.2 56.5	67.2 150.0	
Sugar maple	4"-9" 10" up	...	...	...	61.9 28.8	53.3 24.7	34.2 15.8	66.2 129.4
Soft maple	4"-9" 10" up	...	...	...	88.2 35.3	75.8 30.4	48.7 19.5	57.8 86.1
White birch	4"-9" 10" up	201.8	182.6	128.7	80.0 6.0	68.7 5.2	44.2 3.3	71.0 62.2	
Yellow birch	4"-9" 10" up	...	...	...	19.5 18.0	16.8 15.5	10.8 9.9	...
Beech	4"-9" 10" up	...	...	...	1.6	1.3	0.9	26.2 40.9
Elm	4"-9" 10" up	...	...	...	20.5 20.1	17.6 17.3	11.3 11.1	...
Ironwood	4"-9" 10" up	25.9	23.4	16.5	12.5	10.8	6.9	3.7	
Red oak	4"-9" 10" up	98.4 38.6	89.0 34.9	62.8 24.6	224.7 103.4	193.3 88.9	124.1 57.1	114.9 264.3	
White oak	4"-9" 10" up	59.0 66.9	53.4 60.5	37.7 42.6	83.5 30.6	71.8 26.3	46.1 16.9	72.5 37.2	
Poplar (all)	4"-9" 10" up	70.6 688.2	63.9 622.9	45.0 439.3	226.3 208.1	194.7 179.0	125.0 114.9	45.2 224.0	
Black ash	4"-9" 10" up	...	...	...	15.8 3.0	13.5 2.6	8.7 1.6	12.8 ...
White ash	4"-9" 10" up	...	...	...	11.1 3.0	9.5 2.6	6.1 1.7	...
Basswood	4"-9" 10" up	...	...	...	45.7 40.3	39.2 34.7	25.2 22.3	80.0 161.4
Black cherry	4"-9" 10" up	7.4	6.7	4.7	...	...	...	...
TOTAL HARDWOODS	4"-9" 10" up	463.1 793.7	419.0 718.3	295.4 506.5	891.3 496.6	766.3 427.2	492.2 274.1	550.3 1005.5	
GRAND TOTAL	4"-9" 10" up	610.5 1240.5	552.3 1122.7	389.4 791.6	964.0 599.0	828.8 515.2	532.4 330.6	617.5 1155.5	
TOTAL 4" UP		1851.0	1675.0	1181.0	1563.0	1344.0	863.0	1773.0	

TABLE 16 — (Cont'd)

SPECIES	D.B.H.	MIXEDWOODS MATURE (M-I)			MIXEDWOODS IMMATURE (M-II)			MIXEDWOODS ALL-AGED	
		DENSITY CLASS			DENSITY CLASS				
		1 cu. ft.	2 cu. ft.	3 cu. ft.	1 cu. ft.	2 cu. ft.	3 cu. ft.		
White pine.....	4"-9"	88.9	78.1	49.4	245.3	209.9	136.8	88.9	
	10" up	757.9	665.5	420.9	567.0	485.2	316.3	400.4	
Red pine.....	4"-9"	8.4	7.3	4.6	7.0	6.0	3.9	3.3	
	10" up	—	—	—	5.4	4.6	3.0	10.9	
White spruce.....	4"-9"	—	—	—	—	—	—	2.3	
	10" up	—	—	—	—	—	—	3.7	
Black spruce.....	4"-9"	—	—	—	—	1.8	1.5	1.0	
	10" up	—	—	—	—	—	—	—	
Balsam fir.....	4"-9"	4.2	3.7	2.3	60.8	52.0	33.9	60.4	
	10" up	—	—	—	4.5	3.9	2.5	—	
Hemlock.....	4"-9"	46.9	41.2	26.0	56.2	48.0	31.3	96.1	
	10" up	26.3	23.1	14.6	12.7	10.9	7.1	146.6	
White cedar.....	4"-9"	34.2	30.0	19.0	3.5	3.0	2.0	4.9	
	10" up	20.2	17.7	11.2	—	—	—	5.0	
Larch.....	4"-9"	—	—	—	1.8	1.5	1.0	—	
	10" up	—	—	—	—	—	—	—	
TOTAL CONIFERS.....	4"-9"	182.6	160.3	101.3	376.4	321.9	209.9	255.9	
	10" up	804.4	706.3	446.7	589.6	504.6	328.9	566.6	
Sugar maple.....	4"-9"	18.2	16.0	10.1	6.3	5.5	3.5	32.0	
	10" up	44.5	39.1	24.7	2.5	2.1	1.4	39.7	
Soft maple.....	4"-9"	41.3	36.3	22.9	19.4	16.6	10.8	76.0	
	10" up	34.0	29.8	18.9	—	—	—	62.7	
White birch.....	4"-9"	35.5	31.2	19.7	123.6	105.8	69.0	41.1	
	10" up	—	—	—	7.1	6.0	3.9	10.0	
Yellow birch.....	4"-9"	—	—	—	—	—	—	9.7	
	10" up	—	—	—	—	—	—	12.7	
Beech.....	4"-9"	4.2	3.7	2.3	—	—	—	2.4	
	10" up	—	—	—	—	—	—	17.4	
Elm.....	4"-9"	—	—	—	4.0	3.5	2.2	2.3	
	10" up	—	—	—	4.8	4.1	2.7	—	
Ironwood.....	4"-9"	23.0	20.2	12.8	1.8	1.5	1.0	6.3	
	10" up	—	—	—	—	—	—	—	
Red oak.....	4"-9"	150.4	132.0	83.5	95.2	81.5	53.1	70.9	
	10" up	552.2	484.9	306.6	46.1	39.4	25.7	112.7	
White oak.....	4"-9"	40.1	35.2	22.3	32.9	28.2	18.4	25.2	
	10" up	93.7	82.3	52.0	14.8	12.6	8.2	38.5	
Poplar (all).....	4"-9"	66.9	58.7	37.2	306.3	262.1	170.9	83.9	
	10" up	—	—	—	110.4	94.5	61.6	199.9	
Black ash.....	4"-9"	—	—	—	11.7	10.0	6.5	2.3	
	10" up	—	—	—	6.0	5.1	3.4	—	
White ash.....	4"-9"	—	—	—	—	—	—	0.2	
	10" up	—	—	—	—	—	—	—	
Basswood.....	4"-9"	—	—	—	7.1	6.0	3.9	10.8	
	10" up	—	—	—	—	—	—	4.8	
Black cherry.....	4"-9"	—	—	—	—	—	—	2.0	
	10" up	—	—	—	—	—	—	—	
TOTAL HARDWOODS.....	4"-9"	379.6	333.3	210.8	608.3	520.7	339.3	365.1	
	10" up	724.4	636.1	402.2	191.7	163.8	106.9	498.4	
GRAND TOTAL.....	4"-9"	562.2	493.6	312.1	984.7	842.6	549.2	621.0	
	10" up	1528.8	1342.4	848.9	781.3	668.4	435.8	1065.0	
TOTAL 4" UP.....		2091.0	1836.0	1161.0	1766.0	1511.0	985.0	1686.0	

TABLE 17. — *Volume of the primary growing stock in cubic feet per acre.*
Huron Section — 1956

SPECIES	D.B.H.	CONIFEROUS MATURE (C-I)			CONIFEROUS IMMATURE (C-II)			ALL-AGED <i>cu. ft.</i>	
		DENSITY CLASS			DENSITY CLASS				
		1 <i>cu. ft.</i>	2 <i>cu. ft.</i>	3 <i>cu. ft.</i>	1 <i>cu. ft.</i>	2 <i>cu. ft.</i>	3 <i>cu. ft.</i>		
White pine.....	4"-9" 10" up	18.7 120.7	15.9 102.8	9.9 64.3	20.9 75.0	16.5 59.2	9.2 33.2	.....
White spruce.....	4"-9" 10" up	3.0 13.2	2.5 11.3	1.6 7.0	35.0 20.1	27.6 15.9	15.5 8.9	.....
Balsam fir.....	4"-9" 10" up	35.0 20.1	29.8 17.1	18.6 10.7	126.8 21.8	100.1 17.3	56.0 9.7	.....
Hemlock.....	4"-9" 10" up	127.8 361.7	108.8 307.9	68.0 192.5	72.5 100.1	57.2 79.1	32.0 44.3	.....
White cedar.....	4"-9" 10" up	682.1 861.1	580.7 733.0	362.9 458.2	1055.6 250.8	833.6 198.1	466.8 110.9	.....
Larch.....	4"-9" 10" up	0.7 5.8	0.6 4.9	0.4 3.1	44.8 10.3	35.4 8.1	19.9 4.5	.....
TOTAL CONIFERS.....	4"-9" 10" up	867.3 1382.6	738.3 1177.0	461.4 735.8	1355.6 478.1	1070.4 377.7	599.4 211.5	.....
Sugar maple.....	4"-9" 10" up	10.2 151.9	8.7 129.3	5.4 80.9	6.6 34.1	5.2 27.0	2.9 15.1	.....
Soft maple.....	4"-9" 10" up	8.7 46.4	7.4 39.5	4.6 24.7	17.2 16.4	13.6 12.9	7.6 7.2	.....
White birch.....	4"-9" 10" up	16.5 19.2	14.0 16.4	8.8 10.2	51.7 20.2	40.8 16.0	22.9 8.9	.....
Yellow birch.....	4"-9" 10" up	35.3 120.3	30.1 102.4	18.8 64.0	30.7 29.2	24.2 23.1	13.6 12.9	.....
Beech.....	4"-9" 10" up	4.9 131.3	4.2 111.7	2.6 69.9	0.9 11.1	0.7 8.8	0.4 4.9	.....
Elm.....	4"-9" 10" up	15.4 221.3	13.1 188.4	8.2 117.7	34.3 97.5	27.1 77.0	15.2 43.1	.....
Ironwood.....	4"-9" 10" up	7.1 9.1	6.1 7.7	3.8 4.8	1.1 1.3	0.9 1.0	0.5 0.6	.....
Red oak.....	4"-9" 10" up	..... 6.5	..... 5.5	..... 3.4	0.4 2.0	0.3 1.6	0.2 0.9	.....
White oak.....	4"-9" 10" up	..... 3.2	..... 2.8	..... 1.7	..... .....	..... .....	..... .....	.....
Poplar (all).....	4"-9" 10" up	13.0 61.6	11.0 52.5	6.9 32.8	75.9 70.3	59.9 55.6	33.6 31.1	.....
Black ash.....	4"-9" 10" up	12.0 4.2	10.2 3.6	6.4 2.2	13.5 5.7	10.6 4.5	6.0 2.5	.....
White ash.....	4"-9" 10" up	0.9 5.6	0.8 4.7	0.5 3.0	1.2 8.4	0.9 6.7	0.5 3.7	.....
Basswood.....	4"-9" 10" up	3.2 81.1	2.7 69.1	1.7 43.1	1.7 27.1	1.3 21.4	0.7 12.0	.....
Black cherry.....	4"-9" 10" up	0.2 3.0	0.2 2.6	0.1 1.6	2.4 2.4	1.9 1.9	1.0 1.1	.....
TOTAL HARDWOODS.....	4"-9" 10" up	127.4 864.7	108.5 736.2	67.8 460.0	237.6 325.7	187.4 257.5	105.1 144.0	.....
GRAND TOTAL.....	4"-9" 10" up	994.7 2247.3	846.8 1913.2	529.2 1195.8	1593.2 803.8	1257.8 635.2	704.5 355.5	.....
TOTAL 4" UP.....		3242.0	2760.0	1725.0	2397.0	1893.0	1060.0	.....
		HARDWOODS MATURE (H-I)			HARDWOODS IMMATURE (H-II)			HARDWOODS ALL-AGED <i>cu. ft.</i>	
White pine.....	4"-9" 10" up	0.5 11.1	0.4 9.5	0.3 6.0	2.9 3.7	2.4 3.2	1.5 2.0		
White spruce.....	4"-9" 10" up	.....	.....	.....	1.7 1.6	1.4 1.4	0.9 0.8	0.5 0.2
Balsam fir.....	4"-9" 10" up	.....	.....	.....	5.9 0.7	5.0 0.6	3.1 0.4	1.6 0.3
Hemlock.....	4"-9" 10" up	12.5 48.3	10.6 41.1	6.7 26.2	7.7 12.0	6.5 10.2	4.1 6.4	10.2 26.6	

TABLE 17 — (Cont'd)

SPECIES	D.B.H.	HARDWOODS MATURE (H-I) (Cont'd)			HARDWOODS IMMATURE (H-II) (Cont'd)			HARDWOODS ALL-AGED (Cont'd)	
		DENSITY CLASS			DENSITY CLASS				
		1 cu. ft.	2 cu. ft.	3 cu. ft.	1 cu. ft.	2 cu. ft.	3 cu. ft.		
White cedar	4" 9"	7.1	6.0	3.8	13.6	11.5	7.2	8.8	
	10" up	7.4	6.3	4.0	2.8	2.4	1.5	4.9	
Larch	4" 9"				1.0	0.9	0.6	0.4	
	10" up				0.6	0.5	0.3	0.4	
TOTAL CONIFERS	4" 9"	20.1	17.0	10.8	32.8	27.7	17.4	23.8	
	10" up	66.8	56.9	36.2	21.4	18.3	11.4	51.4	
Sugar maple	4" 9"	232.5	197.7	125.6	337.5	286.3	179.5	305.1	
	10" up	1073.9	913.1	580.2	181.7	154.2	96.7	438.8	
Soft maple	4" 9"	29.3	24.9	15.8	86.1	73.0	45.8	55.1	
	10" up	130.0	110.6	70.3	47.0	39.9	25.0	105.1	
White birch	4" 9"	8.5	7.3	4.6	72.2	61.3	38.4	13.5	
	10" up	8.9	7.5	4.8	14.9	12.6	7.9	15.1	
Yellow birch	4" 9"	12.3	10.5	6.6	14.1	12.0	7.5	11.7	
	10" up	19.6	16.6	10.6	8.9	7.5	4.7	15.5	
Beech	4" 9"	32.4	27.6	17.5	26.9	22.8	14.3	30.5	
	10" up	474.6	403.4	256.4	38.8	33.0	20.6	111.1	
Elm	4" 9"	50.8	43.2	27.5	90.9	77.2	48.4	70.4	
	10" up	447.5	380.4	241.7	132.5	112.4	70.5	274.1	
Ironwood	4" 9"	14.2	12.0	7.6	21.9	18.6	11.7	17.1	
	10" up	9.0	7.7	4.9	2.7	2.3	1.4	3.7	
Red oak	4" 9"	0.8	0.7	0.4	34.7	29.5	18.5	8.3	
	10" up	16.6	14.1	9.0	22.8	19.3	12.1	44.5	
White oak	4" 9"				0.9	0.8	0.5	0.7	
	10" up	2.9	2.5	1.6	0.7	0.6	0.4	3.1	
Poplar (all)	4" 9"	6.5	5.6	3.5	210.2	178.3	111.8	30.2	
	10" up	25.1	21.5	13.7	79.0	67.0	42.0	55.0	
Black ash	4" 9"	11.5	9.8	6.2	33.7	28.6	18.0	27.2	
	10" up	14.6	12.4	7.9	7.4	6.3	3.9	17.2	
White ash	4" 9"	7.7	6.5	4.1	23.9	20.3	12.7	17.7	
	10" up	58.9	50.1	31.8	20.5	17.3	10.9	56.7	
Basswood	4" 9"	11.7	9.9	6.3	22.2	18.8	11.8	13.9	
	10" up	98.4	83.7	53.1	37.0	31.4	19.7	55.8	
Black cherry	4" 9"	4.1	3.4	2.2	13.9	11.8	7.4	6.2	
	10" up	7.5	6.4	4.1	5.8	4.9	3.1	10.8	
TOTAL HARDWOODS	4" 9"	422.3	359.1	227.9	989.1	839.3	526.3	607.6	
	10" up	2387.8	2030.0	1290.1	599.7	508.7	318.9	1209.2	
GRAND TOTAL	4" 9"	442.4	376.1	238.7	1021.9	867.0	543.7	631.4	
	10" up	2454.6	2086.9	1326.3	621.1	527.0	330.3	1260.6	
TOTAL 4" UP		2897.0	2463.0	1565.0	1643.0	1394.0	874.0	1892.0	
MIXEDWOODS MATURE (M-I)									
White pine	4" 9"	11.0	9.4	5.9	5.7	4.8	3.1	18.1	
	10" up	208.5	178.2	112.7	24.8	21.2	13.6	69.7	
White spruce	4" 9"	1.2	1.0	0.6	15.6	13.4	8.6	3.8	
	10" up	4.9	4.2	2.7	13.1	11.1	7.1	5.5	
Balsam fir	4" 9"	11.8	10.1	6.4	75.8	64.6	41.3	18.2	
	10" up	6.5	5.5	3.5	10.4	8.9	5.7	4.8	
Hemlock	4" 9"	123.5	105.5	66.8	37.8	32.2	20.6	68.1	
	10" up	458.9	392.3	248.1	48.4	41.3	26.4	112.9	
White cedar	4" 9"	144.4	123.3	78.0	338.6	289.0	184.8	152.4	
	10" up	269.4	179.0	113.2	86.8	74.1	47.4	100.2	
Larch	4" 9"				15.4	13.2	8.5	2.5	
	10" up	3.0	2.6	1.6	6.1	5.2	3.3	2.6	
TOTAL CONIFERS	4" 9"	291.9	249.3	157.7	488.9	417.2	266.9	263.4	
	10" up	891.2	761.8	481.8	189.6	161.8	103.5	295.7	
MIXEDWOODS IMMATURE (M-II)									
MIXEDWOODS ALL-AGED									

TABLE 17 — (*Cont'd*)

SPECIES	D.B.H.	MIXEDWOODS MATURE (M-I) (<i>Cont'd</i>)			MIXEDWOODS IMMATURE (M-II) (<i>Cont'd</i>)			MIXEDWOODS ALL-AGED (<i>Cont'd</i>)	
		DENSITY CLASS			DENSITY CLASS				
		1 <i>cu. ft.</i>	2 <i>cu. ft.</i>	3 <i>cu. ft.</i>	1 <i>cu. ft.</i>	2 <i>cu. ft.</i>	3 <i>cu. ft.</i>		
Sugar maple.....	4"-9"	60.2	51.4	32.5	22.6	19.3	12.3	62.4	
	10" up	375.9	321.4	203.2	20.5	17.5	11.2	155.2	
Soft maple.....	4"-9"	23.3	19.9	12.6	40.0	34.1	21.8	34.8	
	10" up	92.6	79.1	50.0	35.4	30.2	19.4	65.8	
White birch.....	4"-9"	17.4	14.8	9.4	137.2	117.1	74.9	36.5	
	10" up	43.6	37.3	23.6	36.9	31.5	20.2	45.4	
Yellow birch.....	4"-9"	47.6	40.7	25.7	42.2	36.0	23.0	34.9	
	10" up	138.4	118.3	74.8	38.6	33.0	21.1	55.7	
Beech.....	4"-9"	17.8	15.2	9.6	2.8	2.4	1.5	13.2	
	10" up	299.3	255.8	161.8	6.1	5.3	3.4	76.3	
Elm.....	4"-9"	34.2	29.2	18.5	77.5	66.2	42.3	72.4	
	10" up	398.7	340.9	215.5	170.2	145.2	92.9	337.9	
Ironwood.....	4"-9"	8.6	7.4	4.6	6.3	5.3	3.4	6.6	
	10" up	6.6	5.6	3.6	0.9	0.8	0.5	0.5	
Red oak.....	4"-9"	1.6	1.4	0.9	2.1	1.8	1.1	2.8	
	10" up	25.8	22.0	13.9	3.3	2.8	1.8	11.4	
White oak.....	4"-9"	0.1	0.1	0.1	.....	.....	.....	.....
	10" up	2.9	2.5	1.5	.....	.....	.....	.....
Poplar (all).....	4"-9"	12.6	10.8	6.8	202.3	172.6	110.5	41.9	
	10" up	42.3	36.1	22.9	151.3	129.2	82.6	110.4	
Black ash.....	4"-9"	21.1	18.1	11.4	47.6	40.7	26.0	21.5	
	10" up	12.4	10.6	6.7	8.0	6.8	4.4	14.0	
White ash.....	4"-9"	7.8	6.6	4.2	6.8	5.8	3.7	9.3	
	10" up	28.8	24.7	15.6	7.6	6.5	4.1	13.2	
Basswood.....	4"-9"	9.6	8.2	5.2	10.2	8.7	5.6	16.1	
	10" up	118.4	101.2	64.0	29.3	25.0	16.0	63.7	
Black cherry.....	4"-9"	6.9	5.8	3.7	7.7	6.6	4.2	3.8	
	10" up	11.4	9.8	6.2	3.1	2.6	1.7	5.5	
TOTAL HARDWOODS.....	4"-9"	268.8	229.6	145.2	605.3	516.6	330.3	356.2	
	10" up	1597.1	1365.3	863.3	511.2	436.4	279.3	955.0	
GRAND TOTAL.....	4"-9"	560.7	478.9	302.9	1094.2	933.8	597.2	619.3	
	10" up	2488.3	2127.1	1345.1	700.8	598.2	382.8	1250.7	
TOTAL 4" UP.....		3049.0	2606.0	1648.0	1795.0	1532.0	980.0	1870.0	



Spraying system for seed beds.

Notes

Notes



Hon. C. E. Mapledoram
Minister

F. A. MacDougall
Deputy Minister